CULTURAL RESOURCE SURVEY AND TESTING RESULTS FOR THE ELKINS RESIDENCE PROJECT AT 8260 PASEO DEL OCASO CITY OF SAN DIEGO, CALIFORNIA

(APN 346-231-17-00)

Prepared for:

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October 2016

National Archaeological Data Base Information
Type of Study: Cultural Resource Survey and Test
Sites: none
USGS Quadrangle: La Jolla 7.5'
Area: 0.2 acres
Key Words: City of San Diego, La Jolla Shores, 8260 Paseo del Ocaso, Negative Survey and Test

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ABSTRACT

Laguna Mountain Environmental, Inc. (Laguna Mountain) conducted an archaeological survey and testing program for the Elkins Residence located at 8260 Paseo del Ocaso, in the La Jolla Shores area of the City of San Diego. The proposed project involves demolishing the existing single-family residence to construct a new single-family residence. The archaeological investigation included a records search, literature review, examination of historic maps, field inventory of the property, and subsequent testing.

The goal of the effort was to determine if significant portions of prehistoric site CA-SDI-20130/SDM-W-2 extended within the project area and would be impacted by the project. Cultural resource work was conducted in accordance with the California Environmental Quality Act (CEQA) and the City of San Diego Land Development Code and Historical Resources Guidelines. The City of San Diego will serve as lead agency for the project and CEQA compliance.

The records search was conducted at the South Coastal Information Center at San Diego State University. The record search concluded that the project area had not been previously surveyed, but that at least 42 cultural resource investigations have been conducted within one-quarter mile of the project area. Eleven cultural resources have been identified through previous research within the one-quarter mile radius of the project, seven prehistoric and two historic. The project area falls within the expanded boundary of previously recorded site CA-SDI-20130. The temporary camp site boundary encompasses a large area and is based on sparse early data in the area showing the presence of buried prehistoric shell lenses and associated artifacts.

The survey and test was conducted by Andrew R. Pigniolo, MA, on May 13, 2016. Mr. Justin Linton, of Red Tail Monitoring and Research, Inc., served as Native American monitor. The entire project area was surveyed in less than 5-meter transect intervals. Approximately 70 percent of the lot was covered by the existing residence and hardscape. Within the lawn area and unlandscaped areas of the parcel, surface visibility was good, averaging approximately 75 percent. Grading associated with the construction of the existing residence appears to have been largely focused on cutting, but may include some fill in the back (west) portion of the lot.

The results of this survey indicated that no cultural resources were present on the surface of the property. A single fragment of unidentifiable shell was observed near one planter, but this shell appeared water-worn and recent. Modern refuse and rodent nesting material was present to 30 cm. The absence of cultural material suggests that the project area is not within the boundaries of site CA-SDI-20130.

Because survey visibility was limited and the project is located within the La Jolla Shores Archaeological Study Area, subsurface testing was required. Six hand-excavated shovel test pits (STPs) were excavated within the parcel in order to determine if CA-SDI-20130 extends into the project area. Testing was conducted on May 13, 2016 in conjunction with the survey. Mr. Andrew Pigniolo served as Principal Investigator and Mr. Justin Linton of Red Tail Monitoring & Research served the project as Native American monitor.

Testing suggested that much of the parcel had been previously cut exposing orange sand of Late Pleistocene age. This material had a thin layer of imported turf and topsoil in some areas. In the far northwestern corner of the parcel, testing showed a thin layer of fill over the orange sand. A single *Mytilus* shell fragment was recovered from the 0-10 cm level of STP 4 suggesting that a cultural deposit may once have been present. No other identifiable prehistoric cultural material was identified during testing. No artifacts or other cultural material were recovered or observed other than modern intrusive materials.

While the Native American Heritage Commission has no records of known cultural resources in the project area, because the project is within the La Jolla Shores Archaeological Study Area, monitoring by an archaeological and a Native American monitor is recommended during construction excavation and grading to ensure sensitive resources are not present or impacted by the project.

I. INTRODUCTION

A. Project Description

The proposed project includes the demolition of the existing single-family residence to construct a new single-family residence. As part of the project, demolition, grading and excavation for foundations and utilities will occur. The project area is located in the southwestern portion San Diego County within the La Jolla Shores area in the City of San Diego (Figure 1). It is located west of Interstate 5, west of La Jolla Shores Drive, and south of the Scripps Institute of Oceanography. The project is situated on a residential lot at 8260 Paseo del Ocaso (APN 346-231-17-00). The project is located in an unsectioned portion of Pueblo Lands in Township 15 South, Range 3 West. The project area is shown on the La Jolla USGS 7.5' Quadrangle (Figure 2) and on the City of San Diego 1:800 scale maps (Figure 3).

The Elkins Residence project includes the construction of one-story single-family residence replacing the former residence structure (Figure 4). Excavation will include demolition, new foundation work, and disturbance to remove existing landscaping and hardscape. The property is within a sensitive zone for cultural resources that triggered the requirement for archaeological survey and testing prior to any construction activity.

Cultural resource work was conducted in accordance with the California Environmental Quality Act (CEQA), and the City of San Diego Land Development Code and Historical Resources Guidelines. The City of San Diego will serve as lead agency for the project and CEQA compliance. The survey and testing program was conducted to determine whether there were cultural resources present within the project area, and to evaluate whether resources eligible for nomination to the California Register are present.

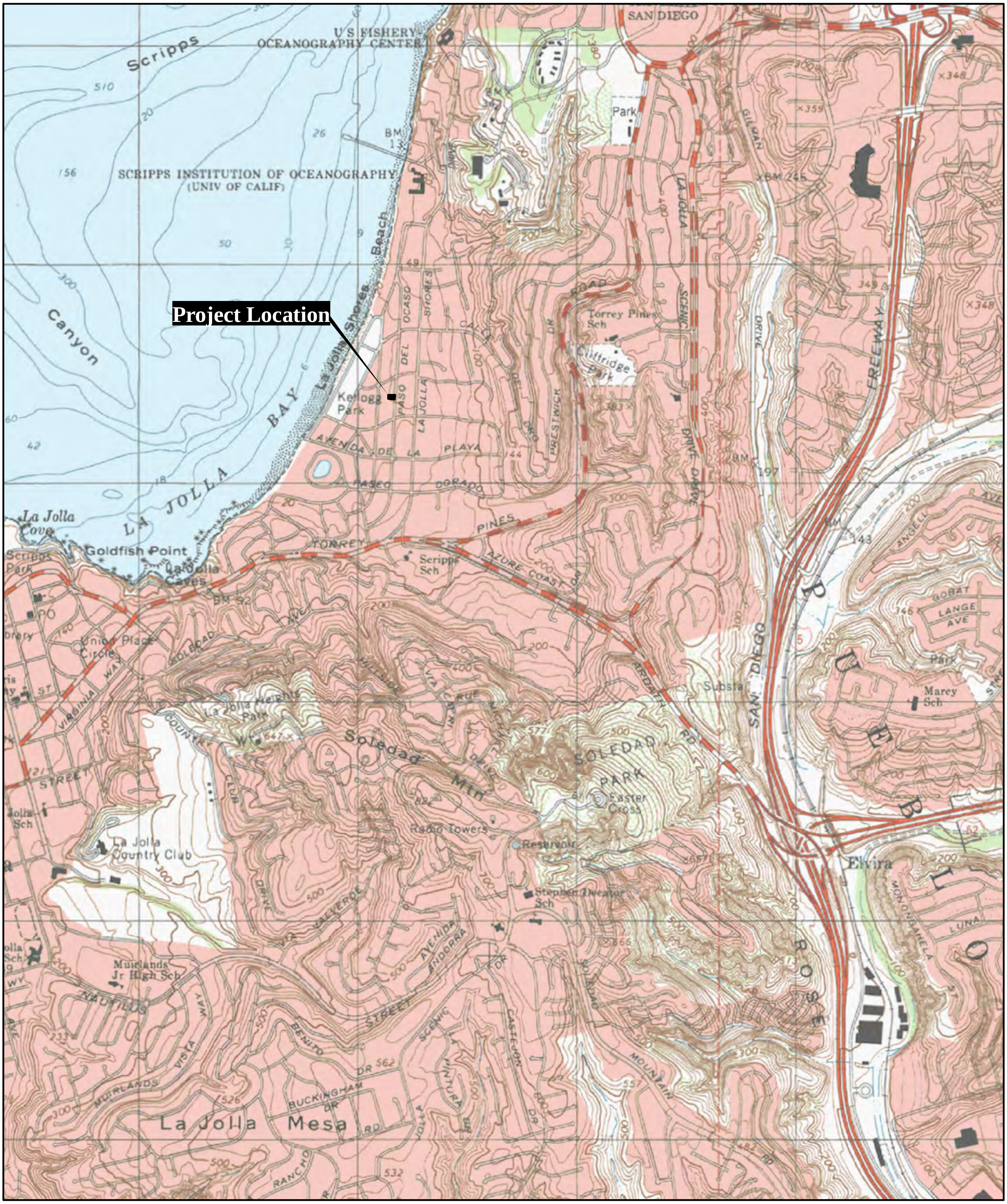
B. Project Personnel

The cultural resource survey was conducted by Laguna Mountain Environmental, Inc. (Laguna Mountain), whose cultural resources personnel meet state and local requirements. Mr. Andrew Pigniolo served as Principal Investigator for the project in addition to field surveyor and report author. Mr. Pigniolo is a member of the Register of Professional Archaeologists (RPA; previously called SOPA), and meets the Secretary of the Interior's standards for qualified archaeologists. He is also a qualified archaeologist within the City of San Diego. Mr. Pigniolo has a MA degree in Anthropology from San Diego State University, along with over 34 years experience in southern California archaeology. His resume is included in Appendix A.

Ms. Carol Serr prepared the report graphics, catalogued the recovered material, and formatted the report. She has a B.A. in Anthropology from San Diego State University and more than 36 years of experience in San Diego archaeology. Mr. Justin Linton, representative of Red Tail Monitoring and Research, Inc., served the project as Native American Monitor.

Figure 1
Regional Location Map

Laguna Mountain Environmental, Inc.



Source: USGS 7.5' La Jolla Quadrangle

Figure 2
Project Location

Laguna Mountain Environmental, Inc.

Project Location

SOURCE: City of San Diego Engineering and Development Map Book 1989: Sheet 250-1689

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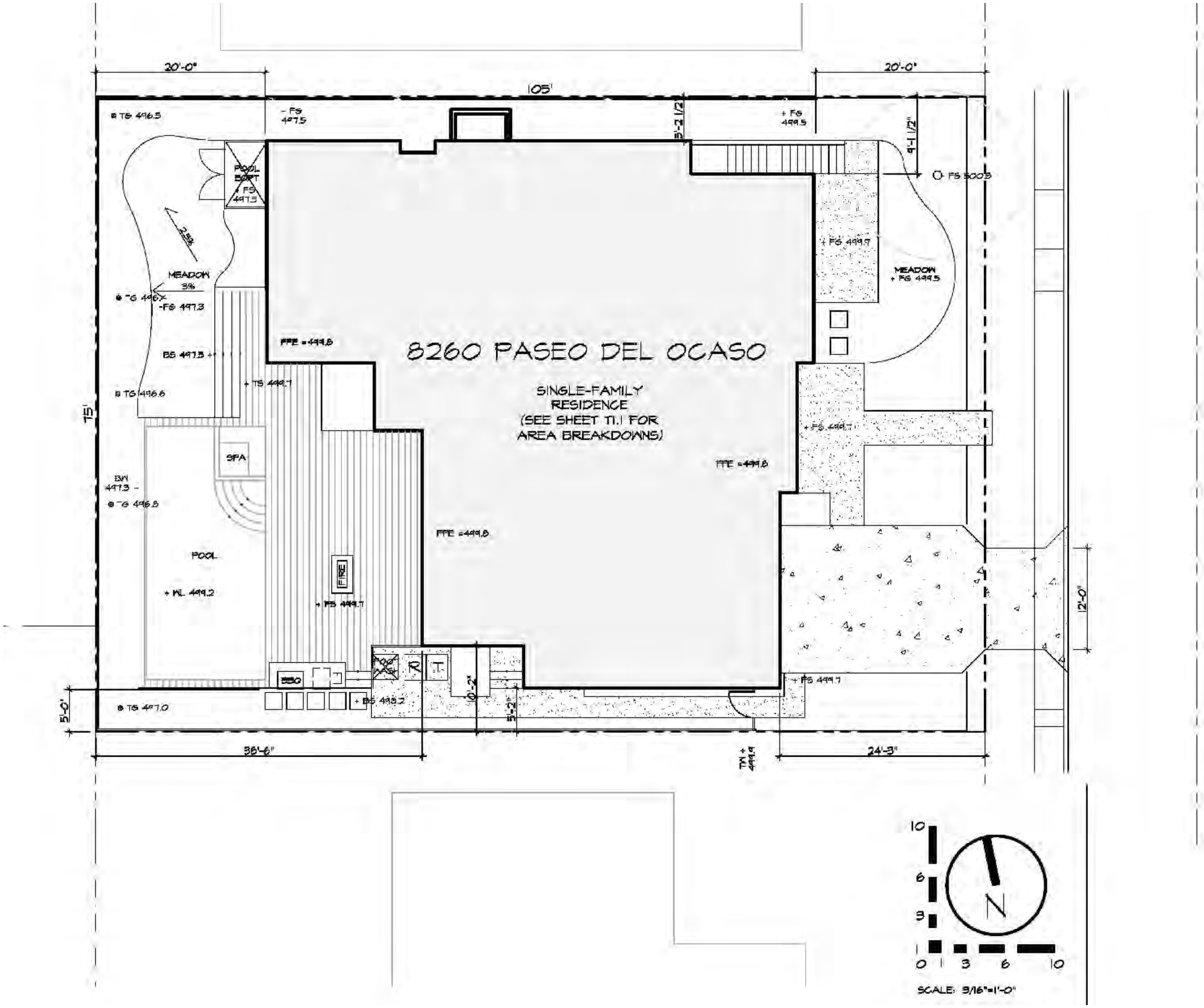
Figure 3
Project Location as Shown on
City of San Diego 1:800 Scale Map

Laguna Mountain Environmental, Inc.



Source: Golba Architecture 12-17-15

Figure 4
Proposed Project Plan

Laguna Mountain Environmental, Inc.

C. Structure of the Report

This report follows the State Historic Preservation Office's guidelines for Archaeological Resource Management Reports (ARMR). The report introduction provides a description of the project and associated personnel. Section II provides background on the project area and previous research. Section III describes the research design and field methods, while Section IV describes the results of the archaeological survey and testing program. Section V provides an evaluation summary and recommendations and Section VI includes the references cited.

II. NATURAL AND CULTURAL SETTING

The following environmental and cultural background provides a context for the cultural resource inventory.

A. Natural Setting

The project area is adjacent to the eastern edge of La Jolla Bay, and elevation is approximately 20 feet above mean sea level. The area is currently located within a developed urban landscape with paved streets and developed residential lots, and has been transformed from its original condition by grading and filling. The project itself is a developed lot containing a single family residence and associated landscaping.

The geomorphology of the project area is largely a product of the region's geologic history. During the Jurassic and late Cretaceous (>100 million years ago) a series of volcanic islands paralleled the current coastline in the San Diego region. The remnants of these islands stand as Mount Helix, Black Mountain, and the Jamul Mountains among others. This island arc of volcanoes spewed out vast layers of tuff (volcanic ash) and breccia that have since been metamorphosed into hard rock of the Santiago Peak Volcanic formation. These fine-grained rocks provided a regionally important resource for Native American flaked stone tools.

At about the same time, a granitic and gabbroic batholith was being formed under and east of these volcanoes. This batholith was uplifted and forms the granitic rocks and outcrops of the Peninsular Range and the foothills to the west. In San Diego County the large and varied crystals of these granitic rocks provided particularly good abrasive surfaces for Native American seed processing. These outcrops were frequently used for bedrock milling of seeds. The batholith contains numerous pegmatite dikes. This was a good source of quartz, a material used by Native Americans for flaked stone tools and ceremonial purposes.

During the Eocene, a series of marine transgressions and regressions, along with sediment and rock deposition from major river systems to the east, left behind a series of sandstone, shale, and conglomerate formations. These sedimentary rocks were later flattened by marine erosion to form the current coastal plain and mesas in the San Diego region. Mount Soledad and Torrey Pines Mesa to the south and north of the project represent uplifts of these Eocene sediments. Some of these sedimentary formations contain porphyritic volcanic and quartzite cobbles that were used for producing both flaked lithic and groundstone tools.

The property itself is underlain by Quaternary alluvium and slopewash (Kennedy 1975). This material is largely derived from nearby Eocene-age formations and may contain buried soils. Just east of the property, however, the urbanized area is underlain by the Bay Point Formation, which is composed mainly of marine and non-marine, poorly consolidated, fine to medium grained, pale brown fossiliferous sandstone. The fossils located within this formation indicate a brackish water estuarine depositional environment and a Late Pleistocene age (Kennedy 1975). The Bay Point Formation dates back to the third interglacial, or Sangamon Period, of the Pleistocene epoch in North America (1.25 m.y.a. to 75,000 y.a.); it is widespread and well exposed in the western portion of San Diego County, particularly in areas adjacent to the coastline (Abbott 1999).

The soil on the property is mapped as the Corralitos Loamy Sand Series (Bowman 1973). This series consists of excessively drained, very deep loamy sands that formed in alluvium derived form marine sandstone. These soils are found in narrow valleys and on small alluvial fans. In the project area these soils occur as Corralitos loam sands on slopes ranging from 5 to 9 percent. In a representative profile, the surface layer is a grayish-brown, slightly acidic loamy sand about 9 inches thick. The next layers are brown, neutral sand that extends to a depth of more than 60 inches (Bowman 1973).

The climate of the region can generally be described as Mediterranean, with cool wet winters and hot dry summers. Rainfall limits vegetation growth. Two vegetation communities adapted to the dry conditions of the area occur in the project area. These include salt-water marsh and coastal sage scrub vegetation. Components of these communities provided important resources to Native Americans in the region. Sage seed, yucca, buckwheat, acorns, and native grasses formed important food resources to Late Prehistoric Native Americans. Torrey pines are also present in the project vicinity and would have provided an additional food resource.

Animal resources in the region included deer, fox, raccoon, skunk, bobcats, coyotes, rabbits, and various rodent, reptile, and bird species. Small game, dominated by rabbits, was relatively abundant. The rocky coastline to the southwest estuary to the southwest and sandy beach to the west of the project area would have provided a variety shellfish, bird, and marine resources.

B. Cultural Setting

Paleoindian Period

The earliest well documented prehistoric sites in southern California are identified as belonging to the Paleoindian period, which has locally been termed the San Dieguito complex/tradition. The Paleoindian period is thought to have occurred between 9,000 years ago, or earlier, and 8,000 years ago in this region. Although varying from the well-defined fluted point complexes such as Clovis, the San Dieguito complex is still seen as a hunting-focused economy with limited use of seed grinding technology. The economy is generally seen to focus on highly ranked resources such as large mammals and relatively high mobility, which may be related to following large game. Archaeological evidence associated with this period has been found around inland dry lakes, on old terrace deposits of the California desert, and also near the coast where it was first documented at the Harris Site.

Early Archaic Period

Native Americans during the Archaic period had a generalized economy that focused on hunting and gathering. In many parts of North America, Native Americans chose to replace this economy with types based on horticulture and agriculture. Coastal southern California economies remained largely based on wild resource use until European contact (Willey and Phillips 1958). Changes in hunting technology and other important elements of material culture have created two distinct subdivisions within the Archaic period in southern California.

The Early Archaic period is differentiated from the earlier Paleoindian period by a shift to a more generalized economy and an increased focus on the use of grinding and seed processing technology. At sites dated between approximately 8,000 and 1,500 years before present (B.P.), the increased use of groundstone artifacts and atlatl dart points, along with a mixed core-based tool assemblage, identify a range of adaptations to a more diversified set of plant and animal resources. Variations of the Pinto and Elko series projectile points, large bifaces, manos and portable metates, core tools, and heavy use of marine invertebrates in coastal areas are characteristic of this period, but many coastal sites show limited use of diagnostic atlatl points. Major changes in technology within this relatively long chronological unit appear limited. Several scientists have considered changes in projectile point styles and artifact frequencies within the Early Archaic period to be indicative of population movements or units of cultural change (Moratto 1984), but these units are poorly defined locally due to poor site preservation.

Late Archaic or Late Prehistoric Period

Around 2,000 B.P., Yuman-speaking people from the eastern Colorado River region began migrating into southern California, representing what is called the Late Prehistoric Period. The Late Prehistoric Period in San Diego County is recognized archaeologically by smaller projectile points, the replacement of flexed inhumations with cremation, the introduction of ceramics, and an emphasis on inland plant food collection and processing, especially acorns (True 1966). Inland semi-sedentary villages were established along major watercourses, and montane areas were seasonally occupied to exploit acorns and piñon nuts, resulting in permanent milling features on bedrock outcrops. Mortars for acorn processing increased in frequency relative to seed grinding basins. This period is known archaeologically in southern San Diego County as the Yuman (Rogers 1945) or the Cuyamaca Complex (True 1970).

The Kumeyaay (formerly referred to as Diegueño) who inhabited the southern region of San Diego County, western and central Imperial County, and northern Baja California (Almstedt 1982; Gifford 1931; Hedges 1975; Luomala 1976; Shipek 1982; Spier 1923) are the direct descendants of the early Yuman hunter-gatherers. Kumeyaay territory encompassed a large and diverse environment, which included marine, foothill, mountain, and desert resource zones. Their language is a dialect of the Yuman language, which is related to the large Hokan super family.

There seems to have been considerable variability in the level of social organization and settlement variance. The Kumeyaay were organized by patrilineal, patrilocal lineages that claimed prescribed territories, but did not own the resources except for some minor plants and eagle aeries (Luomala 1976; Spier 1923). Some lineages occupied procurement ranges that required considerable residential mobility, such as those in the deserts (Hicks 1963). In the mountains, some of the larger groups occupied a few large residential bases that would be occupied biannually, such as those occupied in Cuyamaca in the summer and fall, and in Guatay or Descanso during the rest of the year (Almstedt 1982; Rensch 1975). According to Spier (1923), many Eastern Kumeyaay spent the period of time from spring through autumn in larger residential bases in the upland procurement ranges, and wintered in mixed groups in residential bases along the eastern foothills on the edge of the desert (i.e., Jacumba and Mountain Springs). This variability in settlement mobility and organization reflects the great range of environments in the territory.

Acorns were the single most important food source used by the Kumeyaay. Their villages were usually located near water, which was necessary for leaching acorn meal. Other storable resources such as mesquite or agave were equally valuable to groups inhabiting desert areas, at least during certain seasons (Hicks 1963; Shackley 1984). Seeds from grasses, manzanita, sage, sunflowers, lemonade berry, chia, and other plants were also used along with various wild greens and fruits. Deer, small game, and birds were hunted and fish and marine foods were eaten. Houses were arranged in the village without apparent pattern. The houses in primary villages were conical structures covered with tule bundles, having excavated floors and central hearths. Houses constructed at the mountain camps generally lacked any excavation, probably due to the summer occupation. Other structures included sweathouses, ceremonial enclosures, armadas, and acorn granaries. The material culture included ceramic cooking and storage vessels, baskets, flaked lithic and ground stone tools, arrow shaft straighteners, stone, bone, and shell ornaments.

Hunting implements included the bow and arrow, curved throwing sticks, nets and snares. Shell and bone fishhooks, as well as nets, were used for fishing. Lithic materials including quartz and metavolcanics were commonly available throughout much of the Kumeyaay territory. Other lithic resources, such as obsidian, chert, chalcedony, and steatite, occur in more localized areas and were acquired through direct procurement or exchange. Projectile points including the Cottonwood Series points and Desert Side-notched points were commonly produced.

Kumeyaay culture and society remained stable until the advent of missionization and displacement by Hispanic populations during the eighteenth century. The effects of missionization, along with the introduction of European diseases, greatly reduced the native population of southern California. By the early 1820s, California was under Mexico's rule. The establishment of ranchos under the Mexican land grant program further disrupted the way of life of the native inhabitants.

Ethnohistoric Period

The Ethnohistoric period refers to a brief period when Native American culture was initially being affected by Euroamerican culture and historical records on Native American activities were limited. When the Spanish colonists began to settle California, the project area was within the territory of a loosely integrated cultural group historically known as the Kumeyaay or Northern and Southern Diegueño because of their association with the San Diego Mission. The Kumeyaay as a whole speak a Yuman language, which differentiates them from the Luiseño, who speak a Takic language to the north (Kroeber 1976). Both of these groups were hunter-gatherers with highly developed social systems. European contact introduced diseases that dramatically reduced the Native American population and helped to break down cultural institutions. The transition to a largely Euroamerican lifestyle occurred relatively rapidly in the nineteenth century.

Historic Period

Cultural activities within San Diego County between the late 1700s and the present provide a record of Native American, Spanish, Mexican, and American control, occupation, and land use. An abbreviated history of San Diego County is presented for the purpose of providing a background on the presence, chronological significance, and historical relationship of cultural resources within the county.

Native American control of the southern California region ended in the political views of western nations with Spanish colonization of the area beginning in 1769. De facto Native American control of the majority of the population of California did not end until several decades later. In southern California, Euroamerican control was firmly established by the end of the Garra uprising in the early 1850s (Phillips 1975).

The Spanish Period (1769-1821) represents a period of Euroamerican exploration and settlement. Dual military and religious contingents established the San Diego Presidio and the San Diego and San Luis Rey Missions. The Mission system used Native Americans to build a footing for greater European settlement. The Mission system also introduced horses, cattle, other agricultural goods and implements; and provided construction methods and new architectural styles. The cultural and institutional systems established by the Spanish continued beyond the year 1821, when California came under Mexican rule.

The Mexican Period (1821-1848) includes the retention of many Spanish institutions and laws. The mission system was secularized in 1834, which dispossessed many Native Americans and increased Mexican settlement. After secularization, large tracts of land were granted to individuals and families and the rancho system was established. Cattle ranching dominated other agricultural activities and the development of the hide and tallow trade with the United States increased during the early part of this period. The Pueblo of San Diego was established during this period and Native American influence and control greatly declined. The Mexican Period ended when Mexico ceded California to the United States after the Mexican-American War of 1846-48.

Soon after American control was established (1848-present), gold was discovered in California. The tremendous influx of American and Europeans that resulted quickly drowned out much of the Spanish and Mexican cultural influences and eliminated the last vestiges of de facto Native American control. Few Mexican ranchos remained intact because of land claim disputes and the homestead system increased American settlement beyond the coastal plain.

C. Prior Research

The investigation included archival research and review of other background studies prior to completing the field survey of the project area. The archival research consisted of conducting a literature and record search at the local archaeological repository, in addition to examining historic maps, and historic site inventories. This information was used to identify previously recorded resources and determine the types of resources that might occur in the survey area.

The records and literature search for the project was conducted at the South Coastal Information Center (SCIC) at San Diego State University (Appendix B). In-house data of the San Diego Museum of Man records were examined as well. The records search included a one-quarter mile radius of the project area to provide background on the types of sites that would be expected in the region. Access to historic maps and a historic address database was also provided by the SCIC.

At least 42 archaeological investigations have been conducted in the vicinity of the project (Table 1). Most of these are surveys or monitoring projects for residential assessments as well as infrastructure projects associated with the growth and development of this area over the last 20 years.

Table 1. Archaeological Investigations within One-quarter Mile of the Project Area

Author(s)	**Report Title**	**Year**
Aguilar, Pigniolo, and Serr	Archaeological Monitoring and Testing Report for the Kellogg Park Green Lot Infiltration Project, La Jolla Shores, San Diego, California	2012
Alter	Results of the Historic Building Assessments for 2220, 2222-24, and 2226 Avenida De La Playa, La Jolla, California - The Shopkeeper Project	1998
Alter	Results of Archaeological Monitoring Conducted at 8356 Paseo Del Ocaso, La Jolla, California	1999
Bradbury	Historical Assessment of the Residence Located at 8351 Paseo Del Ocaso, La Jolla, California 92037	1998
Cardenas	Negative Declaration Livingston Residence Renovation	1997
City of San Diego	Proposed Mitigated Negative Declaration of the La Jolla Shores Pipeline No. 2, San Diego, California	1993
City of San Diego	Public Notice of a Proposed Mitigated Negative Declaration for Mccrory Residence	2001
City of San Diego	Whitney Mixed Use	2013
Clowery-Moreno and Smith	A Cultural Resources Study for the 8360 La Jolla Shores Drive Project	2008
Clowery-Moreno and Smith	A Cultural Resources Study for the Walkush Residence Project	2009
Clowery-Moreno and Smith	A Cultural Resources Study for the 8130 La Jolla Shores Drive Project	2009
Crawford	Historical Assessment of the Residence Located at 8211 Paseo Del Ocaso, La Jolla, California 92037	2001
Gilleti	Archaeological Monitoring Report: Barth Residence, La Jolla, San Diego, California Project No. 222715	2011
Goodwin	Archaeological Monitoring Program, La Jolla Shores Drive Water Main Replacement, City of San Diego, California	2012
Kyle	Cultural Resource Constraint Study for the La Jolla Water Main Replacement Project, City of San Diego, California	2001
Mattingly	Archaeological and Geospatial Investigations of Fire-altered Rock Features at Torrey Pines State Reserve, San Diego, California	2007
May and May	Historical Nomination of the Dr. Frank J. and Marion E. Dixon House, 2355 Avenida De La Playa, La Jolla Shores Neighborhood, La Jolla, California	2011
McGeorge and Smith	Mitigation Monitoring Report for the Wells Residence Project, La Jolla, California	2012
McGeorge and Smith	Mitigation Monitoring Report for the Wells Residence Project, 8217 Paseo Del Ocaso, La Jolla, California	2013
McGeorge and Smith	Mitigation Monitoring Report for the Pelberg Residence Project 8335 Camino Del Oro, La Jolla, California	2013
McLean	Results of Archaeological and Paleontological Monitoring at 8356 Paseo Del Ocaso, La Jolla, San Diego County, California	2000
Moomjian	Historical Assessment of the Residence Located at 8356 Paseo Del Ocaso, La Jolla, California 92037	1998
Moomjian	Historical Assessment of the Residence Located at 8130 La Jolla Shores Drive Residence, La Jolla, California 92037	2008
Moomjian	Historical Assessment of the 8368 Paseo Del Ocaso Residence, La Jolla, California 92037	2009

Table 1. Archaeological Investigations within One-quarter Mile of the Project Area (Continued)

Author(s)	Report Title	Year
Moomjian	Historical Assessment of the 8314 Paseo Del Ocaso Residence, La Jolla, California	2009
Pierson	Archaeological Resource Report For: Archaeological Survey of the Kusman Residence	2007
Pierson	Archaeological Resource Report Form: Mitigation Monitoring of the Walkush Residence San Diego, California	2011
Pigniolo	Cultural Resource Survey, Testing, and Geotechnical and Construction Monitoring Results for the Postlethwaite Residence at 8315 Paseo Del Ocaso, La Jolla Shores, City of San Diego, California	2013
Pigniolo et al.	Research and Testing a the La Jolla Shores Site (CA-SDI-20130/SDM-W-2) and the La Jolla Shores Extension Site (CA-SDI-20129/SDM-W-199) for the Residential Block 1J West Underground Utility District Project, La Jolla, California.	2012
Robbins-Wade	Archaeological Resources Assessment: Whitney Mixed Use Project, La Jolla, San Diego, California	2009
Robbins-Wade	Archaeological Resources Inventory: Whitney Family Residence, La Jolla, San Diego, California	2009
Robbins-Wade and Davison	Vaccaro Residence (8321 El Paseo Grande), Project No. 344261 Cultural Resources Monitoring	2014
Rosenberg	Draft Monitoring Report for Archaeological Monitoring - Torrey Pines/La Jolla Shores Drive	2008
Stropes	Cultural Resource Monitoring Report for the Gatto Residence Project	2012
Stropes	Archaeological Survey of the Liske Residence, 8323 Paseo Del Ocaso, La Jolla, California 92037	2013
Stropes and Hoff	A Phase I Cultural Resource Study for the La Fond Residence Project, La Jolla, California	2011
Stropes and Smith	A Cultural Resources Study for the Gatto Residence Project	2009
Stropes and Smith	A Phase I Cultural Resource Study for the Wells Residence Project	2011
Stropes and Smith	Archaeological Survey of the Rohmiller Residence for a Bulletin 560 Permit Application, 2350 Calle De La Garza, La Jolla, California 92037	2013
Whitaker	ETS #20949, Cultural Resources Monitoring for the Handhole Replacement, H2524369127, La Jolla, San Diego County, California	2010
Zepeda-Herman	Background Research and Test Excavation for the Sewer and Water Group 809, San Diego, California	2011
Zepeda-Herman	Significance Test Excavation for the Avenida De La Playa Storm Drain, San Diego, California	2012

The 11 cultural resources identified by the previous investigations within the one-quarter mile radius include minor prehistoric shell and lithic scatters, a temporary camp, and a large habitation site area to the south along with an isolate grinding tool as well as two historic refuse deposits and five historic structures (Table 2). Only the habitation site CA-SDI-20130/SDM-W-2 has been recorded to occur within the current project area.

Table 2. Archaeological Resources within One-quarter Mile of the Project Area

Resource Number	Resource Type	Recorder (Year)
CA-SDI-19235	Shell and lithic scatter (disturbed)	Clowery-Moreno (2008)
CA-SDI-20130 (SDM-W-2)	Habitation site with burials	Rogers (1926)
CA-SDI-20151	Lithic scatter and hearth	Rochester & Stout (2010)
CA-SDI-20455	Historic refuse deposit	Yerka (2011)
CA-SDI-20456	Historic refuse deposit	Yerka (2011)
P-37-016719	Commercial structure (1952)	Alter (2000)
P-37-016720	Commercial structure (1950s)	Alter (2000)
P-37-016721	Commercial structure (1950s)	Alter (2000)
P-37-018406	Historic house (1949)	Alter (2000)
P-37-018620	Historic house (1946)	Moomjian (1998); McHenry (1999)
P-37-032639	Isolate metate	Goodwin (2012)

CA-SDI-20130/SDM-W-2

Rogers first identified site CA-SDI-20130/SDM-W-2 during grading to level the area for a housing development in 1926. He (Rogers 1931:1) noted:

> On visiting the site I observed the following conditions; a long ridge which paralleled the sea shore was being torn down to fill a depression between it and the shore. A shell-midden of an average depth of one foot had already been scraped off into the depression, and a steam shovel had completed a cut seventy feet wide and seven feet deep through the ridge.

This described the grading that most transformed the La Jolla Shores site to its current status. Essentially the ridge that made up the CA-SDI-20130/SDM-W-2 site was graded and leveled. One of the important aspects of Rogers statement is that he clearly indicates that the midden material and probably most of the site was graded to the west of its original location and was used as fill for the estuary in that location. This is important for an assessment of where secondary material and human remains from the site may be located.

Another note supports the idea that the site material was transported to the west into the original estuary. Rogers (nda) states that “John Glenn visited the site occasionally during the summer and saved some specimens from the lagoon fill.”

Rogers also noted elsewhere (Rogers 1926:2) that the entire site was being removed to a depth of 7 feet. Based on his stratigraphic profile this would have removed the site to below the red sand stratum. This should provide confirmation that all of the midden stratum and most of the red sand stratum with the human remains were removed and graded off their original location except where they may have been present on the slopes of the ridge.

The 1928 aerial photograph of the area indicates that the grading initiated in 1926 had been essentially completed and that the estuary north of Avenida de la Playa was filled by this time. The area was still largely undeveloped with only a few houses and streets were only partially paved. Pavement and sidewalks can be seen on Paseo del Ocaso. An oblique photograph of the same area taken in 1927 shows that only a year after Rogers made his collections during grading, the ridge that formed CA-SDI-20130/SDM-W-2 had been leveled and the La Jolla estuary north of Avenida de la Playa was completely filled.

The 1930 USGS map of the area generally corresponds with the cultural changes occurring to the site, but the topographic changes have not been made to the map. The structures and roads within the site area generally correspond to the aerial photo data from this period.

The 1943 USGS map reflects the topographic changes made in 1926. At this time the ridge on which CA-SDI-20130/SDM-W-2 no longer stands out topographically, and the estuary is no longer present. Streets have been completed in the La Jolla Shores area, but houses are still sparse.

It is interesting to note that sometime between the 1930 map and 1943, a large structure was constructed at the La Jolla Beach and Tennis Club and the remainder of the estuary has been reduced by fill to a small pond as it remains today.

It is important to note that the portion of the original estuary, south of Avenida de la Playa and west of Calle de la Plata, was open water in 1928. Because this area was dry at earlier times this suggests that the pond may have been partially dredged to fill, upon which original portions of the La Jolla Beach and Tennis Club were built. This, in combination with the original contours, indicate that fill from the CA-SDI-20130/SDM-W-2 ridge must be, at a maximum extent, bound by an area with Avenida de la Playa on the south, La Jolla Shores on the southeast, the segment of Vallecitos between Paseo Del Ocaso and La Jolla Shores Drive on the east central side. The line would then follow Paseo Del Ocaso north to Camino del Oro and across the Kellogg Park parking lot west to the original beach berm. The beach berm (La Vereda Street) would serve as a western boundary between this point and the beginning point at Avenida de la Playa. That this area was filled to some extent or another in 1926-1927 is confirmed by a comparison of Rogers' pre-grading contours with those of today.

The other important point about the lack of fill south of Avenida de la Playa is that it sets a maximum southern boundary for the possibility of site material originating from CA-SDI-20130/SDM-W-2. Gross (1999) conducted STP testing within the La Jolla Beach and Tennis Club property in 1999. He identified a small amount of prehistoric cultural material in fill in this area. As indicated in the 1928 aerial, much of the area he tested was open water in 1928 so the presence of fill in this area is expected. The fill included one Tizon Brown Ware sherd and four flakes or prehistoric origin (Gross 1999). This secondary material was recorded as the location of SDM-W-2 by Gross (1999) and assigned a primary number of P-37-018179.

A reconstruction of post depositional processes at CA-SDI-20130/SDM-W-2 suggest that this secondary material that has been recorded as material from CA-SDI-20130/SDM-W-2 is more likely secondary material from CA-SDI-39/SDM-W-1. This is supported by the absence of fill south of Avenida de la Playa on the 1928 aerial photograph, the difference in property ownership and the unlikelihood that fill would be transported from one property to another at that period in time, and the presence of a Tizon Brown Ware sherd in the La Jolla Beach and Tennis Club fill. No ceramics have been described or identified at CA-SDI-20130/SDM-W-2 while they are abundant in the upper levels of CA-SDI-39/SDM-W-1. It is likely that during later development of the La Jolla Beach and Tennis Club buildings, this area of the estuary was filled with material derived from grading and construction of these buildings on the higher elevation portions of the La Jolla Beach and Tennis Club property, south of the estuary where CA-SDI-39/SDM-W-1 is located.

In the years after the 1920s it is easier to make a comparison of the original landform of the area with the current post-grading contours. This again indicates that the original ridge that made up the CA-SDI-20130/SDM-W-2 site had been largely eliminated by 1930 and that the whole CA-SDI-20130/SDM-W-2 area was relatively level by this time. The vertical exaggeration does suggest that some of the relative contour of the ridge remains, but that roads and house pad construction has somewhat terraced the area.

Historic research included an examination of a variety of resources. The current listings of the National Register of Historic Places were checked through the National Register of Historic Places website. The California Inventory of Historic Resources (State of California 1976) and the California Historical Landmarks (State of California 1992) were also checked for historic resources. The historic resources mapped in the area were determined as not significant.

III. RESEARCH DESIGN AND METHODS

A. Survey Research Design

The goal of this study was to identify any cultural resources located within the project area so that the effects of the project on these resources can be assessed and minimized. To accomplish this goal, background information was examined and assessed, and a field survey was conducted to identify cultural remains. Additionally, a Sacred Lands record search was requested from the Native American Heritage Commission (NAHC) (Appendix C).

Based on the records search and historic map check, most of the cultural resources that might occur within the project were likely to be prehistoric resources. Historic structures appear within one-quarter mile of the project area on early maps of the area, but are unlikely to occur within the project itself based on early maps. Prehistoric cultural resources such as CA-SDI-20130/SDM-W-2 could include midden soils, shell and lithic scatters, and hearth features associated with marine and estuary utilization in the area. Special attention was given to naturally exposed soil deposits. Because the project area is developed and located in the La Jolla Shores Archaeological Study Area, testing was required to establish whether archaeological deposits extend into the project area. Both phases of investigation are described in more detail below.

B. Survey Methods

The survey and test was conducted by Andrew R. Pigniolo, MA, on May 13, 2016. Mr. Justin Linton, of Red Tail Monitoring and Research, Inc., served as Native American monitor. The entire project area was surveyed in less than 5-meter transect intervals. Approximately 70 percent of the lot was covered by the existing residence and hardscape. Within the lawn area and unlandscaped areas of the parcel, surface visibility was good, averaging approximately 75 percent. Grading associated with the construction of the existing residence appears to have been largely focused on cutting, but may include some fill in the back (west) portion of the lot.

Photographs taken and project records for this inventory will be temporarily curated at Laguna Mountain until final curation arrangements can be made at the San Diego Archaeological Center or another appropriate regional repository.

C. Test Methods

Subsurface testing was conducted in the project area in order to determine if portions of site CA-SDI-20130/SDM-W-2, or any other previously unrecorded site, were present within the project area. The subsurface testing included the excavation of six 30 m by 50 cm shovel test pits (STPs) in order to assess the presence of any subsurface deposits. Testing was conducted on May 13, 2016 subsequent to the survey. Mr. Andrew Pigniolo served as Principal Investigator and Mr. Justin Linton of Red Tail Monitoring & Research served the project as Native American monitor.

STPs are normally placed in the cardinal directions along a Cartesian grid pattern, but due to the amount of developed area on the property and the limited landscaped areas where soil was exposed, STPs were intuitively placed in open areas distributed across the proposed area of direct impacts. The long axis of each STP was oriented north/south.

STPs were excavated in 10-cm arbitrary levels. All excavated soil was passed through 1/8-inch mesh hardware cloth and dry-screened in the field. Any cultural material was removed from the screens and bagged by level. STP forms noting the recovery and observations were completed following the excavation of each 10-cm level. The information gathered included the type of cultural material recovered, soil types and conditions, and any noted disturbance. Recovered material was taken to the laboratory for processing. All items were weighed on a digital scale. The recovered material was entered into an Excel spreadsheet that serves as the recovery catalog (Appendix D).

A photographic record was kept to document the testing program (Appendix E). Digital photographs were taken during STP excavation. A photographic log was kept to document orientation and subject matter.

IV. RESULTS

The project area is currently a developed residence with a large amount of hardscape and landscape. Figure 5 provides views of the site conditions. Figure 6 shows the STP locations.

A. Survey Results

The cultural resource survey resulted in no indications of prehistoric or historic material on the surface of the parcel and proposed impact area. No surface cultural material was observed on the survey of the property. A single fragment of unidentifiable shell was observed near one planter, but this shell appeared water-worn and recent. The absence of cultural material suggests that the project area is not within the boundaries of site CA-SDI-20130/SDM-W-2 or that the site deposit was previously graded away in this area.

The project area is approximately 70 percent covered by development and hardscape. Because the project area is highly developed, the survey did not adequately serve to determine if cultural resources were present, therefore a testing program was subsequently implemented to identify whether there are any subsurface cultural deposits within the project area.

B. Testing Results

Because survey visibility was limited, the project is located within the La Jolla Shores Archaeological Study Area, and site CA-SDI-20130/SDM-W-2 existed in the vicinity, six hand-excavated STPs were excavated within the project area in order to determine if CA-SDI-20130/SDM-W-2 deposits were present in the project area.

Testing indicated a relatively consistent pattern of light brown sandy loam imported topsoil associated with sod grown with a net over orange-yellow sand. STPs were excavated in existing lawn areas as well as unlandscaped portions of the back yard. Small amounts of modern intrusive material were recovered from all of the STPs and most of the intrusive material was found in upper soil levels due to previous disturbance. Fill disturbance was also noted in STP 2. Recovery included one small piece of marine shell (*Mytilus*) from STP 4, weighing 0.3 grams, which does not appear to be cultural, faunal bone that appears to be intrusive (probably dog bones), along with other intrusive material dominated by construction material (concrete, brick, nails).

Soils and Stratigraphy

Soils in all six STPs were fairly consistent. They included a thin layer (approximately 3 cm) of sod in the lawn area. The sod was associated with non-local sandy loam soil and was planted in plastic mesh. This soil extended to between 5 and 15 cm in depth and was a dark gray (Munsell 5YR 3/1) sandy loam. No cultural material was observed in this soil layer. Occasional fragments of intrusive building materials suggest that the upper portions of the soil were placed or partially disturbed at the time of house construction.

a. Front Yard Overview, Looking West (PR-05406-005)

b. Back Yard Overview, Looking South (PR-05406-002)

Figure 5
Site Overviews

Source: Google Maps 2016

Figure 6
STP Locations

N

0 20 40 ft.

Laguna Mountain Environmental, Inc.

All six STPs showed a consistent pattern of orange-hued sand below the upper soil layer. The "reddish brown" (Munsell 5YR 4/4) sand included less organic material than the upper soil. Portions of the orange sand increased in compaction and lacked previous disturbance with depth. This orange sand was found from 5 to 40 cm in depth and probably extends much deeper than the test termination depth. Figure 7 shows a typical STP profile.

Figure 7
STP 5 30 cm Floor Showing Soils,
Looking North (PR-05406-027)

The overall stratigraphic pattern suggests that native soils from the lot were shallow and possibly graded away during leveling of the neighborhood in the 1920s. Some topsoil was later imported along with grass and landscaping and recent intrusive materials were incorporated into these soils.

STP Recovery

The excavation of six STPs resulted in the recovery of one small fragment (0.3 g) of faunal shell (*Mytilus*), 1.4 grams of faunal bone which appears to be intrusive based on weathering and form, and 380.1 g of modern intrusive material (Table 3). By weight, STP 3 produced the most intrusive material with a total of 166.4 grams.

Table 3. STP Recovery Summary by Provenience

Class	STP 1	STP 2	STP 3	STP 4	STP 5	STP 6	Total	Percent
Faunal Shell	—	—	—	0.3	—	—	0.3	0.1
Faunal Bone*	—	1.4	—	—	—	—	1.4	0.4
Intrusive	25.0	44.8	166.4	67.2	26.2	58.5	388.1	99.6
Total Weight (g)	**25.0**	**46.2**	**166.4**	**67.5**	**26.2**	**58.5**	**389.8**	**100.0**
Percent	**6.4**	**11.9**	**42.7**	**17.3**	**6.7**	**15.0**	**100.0**	

* modern

Table 4 shows STP recovery by depth. It indicates that the shell was limited to the upper level of STP 4. The amount of intrusive material decreases sharply below 20 cm indicating a higher level of disturbance in the upper two soil levels and greater integrity in the subsoil material. This supports the idea that the native soil has been disturbed by previous house construction activity while the subsoil is relatively undisturbed.

Table 4. STP Recovery Summary by Depth

	Level (cm)					
Class	**0-10**	**10-20**	**20-30**	**30-40**	**Total**	**Percent**
Faunal Shell	0.3	—	—	—	0.3	0.1
Faunal Bone*	—	1.0	0.4	—	1.4	0.4
Intrusive	152.5	185.9	49.6	0.1	388.1	99.6
Total Weight (g)	**152.8**	**186.9**	**50.0**	**0.1**	**389.8**	**100.0**
Percent	**39.2**	**47.9**	**12.8**	**0.0**	**100.0**	

* modern

Most of the recovered intrusive material represents building waste including nails, concrete, small brick fragments, and bits of tar (see Appendix C). Small amounts of domestic refuse were present including bottle and bulb glass, miscellaneous plastic and metal, suggesting that the material represents both house construction debris and domestic waste.

Summary

The survey and testing program indicates that the project area has been disturbed by previous leveling of the area and construction of the existing residence and landscaping. The lack of a subsurface deposit indicates the parcel has been graded below or is situated outside the original boundaries of site CA-SDI-20130/SDM-W-2.

Additionally, the NAHC indicated that their records failed to indicate the presence of Native American cultural resources in the immediate project area. However, the absence of information in the sacred lands file does not mean there would not be any cultural resources present in the project area.

V. SUMMARY AND RECOMMENDATIONS

The goal of the project was to identify resources that may be impacted by the project. The lack of surface and subsurface prehistoric cultural material suggest that the project area is not within the boundaries of site CA-SDI-20130/SDM-W-2.

The surface of the property was highly obscured by development and the area contains deposits that could be covering or obscuring cultural features. While the NAHC has no records of known cultural resources in the project area, because the project is within the La Jolla Shores Archaeological Study Area, monitoring by an archaeological and a Native American monitor is recommended during construction excavation and grading to ensure sensitive resources are not present or impacted by the project.

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APPENDICES

A. Resume of Principal Investigator
B. Records Search Confirmation
C. Native American Correspondence
D. Catalogue
E. Photos and Photo Logs

APPENDIX A

RESUME OF PRINCIPAL INVESTIGATOR

ANDREW R. PIGNIOLO, M.A., RPA
Principal Archaeologist
Laguna Mountain Environmental, Inc.

Education

San Diego State University, Master of Arts, Anthropology, 1992
San Diego State University, Bachelor of Arts, Anthropology, 1985

Professional Experience

2002-Present	Principal Archaeologist/President, Laguna Mountain Environmental, Inc., San Diego
1997-2002	Senior Archaeologist, Tierra Environmental Services, San Diego
1994-1997	Senior Archaeologist, KEA Environmental, Inc., San Diego
1985-1994	Project Archaeologist/Senior Archaeologist, Ogden Environmental and Energy Services, San Diego
1982-1985	Reports Archivist, Cultural Resource Management Center (now the South Coastal Information Center), San Diego State University
1980-1985	Archaeological Consultant, San Diego, California

Professional Affiliations

Register of Professional Archaeologists (RPA; formerly called SOPA), 1992-present
Qualified Archaeology Consultant, San Diego County
Qualified Archaeology Consultant, City of San Diego
Qualified Archaeology Consultant, City of Chula Vista
Qualified Archaeology Consultant, Riverside County
Society for American Archaeology
Society for California Archaeology

Qualifications

Mr. Andrew Pigniolo is a certified archaeology consultant for the County and City of San Diego. He has received 40 hour HAZWOPPER training and holds an active card for hazardous material work. Mr. Pigniolo has more than 30 years of experience as an archaeologist, and has conducted more than 700 projects throughout southern California and western Arizona. His archaeological investigations have been conducted for a wide variety of development and resource management projects including military installations, geothermal power projects, water resource facilities, transportation projects, commercial and residential developments, and projects involving Indian Reservation lands. Mr. Pigniolo has conducted the complete range of technical studies including archaeological overviews and management plans, ethnographic studies, archaeological surveys, test excavations, historical research, evaluations of significance for National Register eligibility, data recovery programs, and monitoring projects.

REPRESENTATIVE PROJECTS

Centinela Solar Project, Imperial County, California *(KP Environmental, Inc.)* Mr. Pigniolo served as the Principal Investigator for a cultural resource survey of more than 240 acres of agricultural land near Mt. Signal, California. The survey was conducted in multiple phases based on crop conditions and surface visibility within various parcels. The project included surveys of highly impacted agricultural lands. Historic-age agricultural features were identified within several parcels. Cultural resources within the proposed project area were recorded during the survey and recommendations for impact avoidance were made. This project was conducted under both Federal and State environmental requirements.

Princess Street Monitoring and Data Recovery Project at the Spindrift Site *(City of San Diego).* Mr. Pigniolo served as a Principal Investigator of an archaeological monitoring and data recovery program at the Spindrift Site in the community of La Jolla in the City of San Diego. The effort was initially to provide archaeological monitoring of a utility undergrounding project. The presence of the major prehistoric village site within the project alignment quickly became evident prior to construction monitoring and a data recovery plan was prepared prior to the start of work. Monitoring was conducted until the site was encountered. The data recovery plan was immediately implemented, so that data recovery could progress while construction excavation continued on other portions of the project. Data recovery included the excavation of 25 controlled units and the water screening of 100 percent of the archaeological site material impacted during trenching. More than 40 fragmented human burials were encountered. Working with Native American monitors and representatives, the remains were repatriated.

Hill Street Undergrounding Project, Point Loma, California *(City of San Diego).* Mr. Pigniolo served as Principal Investigator of an archaeological monitoring project of utility undergrounding in the community of Point Loma. The project was located in an urban environment under city streets. Archaeological monitoring identified two prehistoric sites with high levels of integrity. Testing included the excavation of four units to evaluate the significance of these resources and mitigate project effects. A hearth feature, shell and a variety of prehistoric artifacts were recovered and additional impacts to the sites were avoided by reducing trench depth.

Center City Development Corporation Area 1 Utility Undergrounding Project, San Diego, California (*City of San Diego*). Mr. Pigniolo served as Principal Investigator of an archaeological monitoring project including the undergrounding of residential and commercial utilities in the community of Logan Heights in San Diego. The project was conducted under CEQA and City of San Diego guidelines. Historic streetcar lines were encountered along with sparse historic trash deposit, but adverse impacts did not occur and no further work was recommended.

Mission Hills Sever Group 664 Project *(Lamprides Environmental Organization)* Mr. Pigniolo was the Principal Investigator for an archaeological monitoring project for a sewer line replacement in the community of Mission Hills in the City of San Diego. The project included archaeological construction monitoring in an urban environment. The project was located near the Old Town area of San Diego, but steep slopes and previous pipelines in the area resulted in an absence of cultural materials encountered.

City of San Diego Sever Group 783 Project, San Diego, California *(Orion Construction Company)* Mr. Pigniolo was the Principal Investigator for an archaeological monitoring project for a sewer line replacement in the eastern portion of the City of San Diego. The project included archaeological construction monitoring in an urban environment. Shallow soils and previous pipeline disturbance in the area resulted in an absence of cultural materials encountered (2006-2007)

All American 105 Race Project, West Mesa, Imperial County, California *(Legacy 106, Inc.)* Mr. Pigniolo served as Principal Investigator, report author, and crew chief for an archaeological survey for a proposed off-road vehicle race course in the West Mesa area of Imperial County. The survey covered Bureau of Land Management (BLM) lands and included close coordination with BLM staff. The survey included a proposed 7.5 mile course with a very short time-frame. The goal was project alignment adjustment and realignment to avoid resource impacts where possible. A variety of prehistoric cultural resources including 10 sites and 7 isolates were encountered. Human remains were identified and avoided. The race route was realigned to avoid significant resource impacts allowing the race to proceed on schedule.

Victoria Loop Road Survey, Alpine, San Diego County, California (*Alpine Fire Safe Council*) Mr. Pigniolo served as Principal Investigator of an 85-acre cultural resource survey in the Alpine area of San Diego County. The survey identified six cultural resources within the project area including prehistoric lithic scatters, an historic well, and historic artifact scatters. All resources were flagged and marked for avoidance during the vegetation treatment program. The Bureau of Land Management served as Federal Lead Agency for the project.

Spirit of Joy Church Project Testing Program, Ramona, San Diego County, California (*Spirit of Joy Lutheran Church*) Mr. Pigniolo served as Principal Investigator and Project Manager a cultural resource testing program at site CA-SDI-17299. The site was a sparse temporary camp. The project included surface collection and subsurface testing. Subsurface deposits were not identified within the project area and the site material was recovered during testing. Construction monitoring was recommended to address alluvial soils within other portions of the project area.

Alpine Fire Safe Council Brush Management Monitoring Project, Alpine Region, San Diego County, California (*Alpine Fire Safe Council*) Mr. Pigniolo served as Principal Investigator for a cultural resources monitoring and protection program on four project areas surrounding Alpine, California. Cultural resources identified during previous surveys within the vegetation treatment areas were flagged for avoidance. The project included hand clearing and chaparral mastication near residential structures to create a fire buffer zone. Vegetation removal was monitored to ensure cultural resources obscured by heavy vegetation were not impacted by the project and that all recorded cultural resources were avoided. The Bureau of Land Management served as Lead Agency for the project.

APPENDIX B

RECORDS SEARCH CONFIRMATION

South Coastal Information Center
San Diego State University
5500 Campanile Drive
San Diego, CA 92182-5320
Office: (619) 594-5682
www.scic.org
scic@mail.sdsu.edu

CALIFORNIA HISTORICAL RESOURCES INFORMATION SYSTEM
CLIENT IN-HOUSE RECORDS SEARCH

Company: Laguna Mountain Enviro

Company Representative: Carol Serr

Date: 5/25/2016

Project Identification: 8620 Paseo Ocaso Survey/Testing 1615

Search Radius: 1/4 mile

Historical Resources: SELF

Trinomial and Primary site maps have been reviewed. All sites within the project boundaries and the specified radius of the project area have been plotted. Copies of the site record forms have been included for all recorded sites.

Previous Survey Report Boundaries: SELF

Project boundary maps have been reviewed. National Archaeological Database (NADB) citations for reports within the project boundaries and within the specified radius of the project area have been included.

Historic Addresses: SELF

A map and database of historic properties (formerly Geofinder) has been included.

Historic Maps: SELF

The historic maps on file at the South Coastal Information Center have been reviewed, and copies have been included.

Copies: 8

Hours: 1.5

Carol Serr

This is not an invoice. Please pay from the monthly billing statement

APPENDIX C

NATIVE AMERICAN CORRESPONDENCE

Laguna Mountain Environmental, Inc.

June 29, 2016

Katy Sanchez
Associate Government Program Analyst
Native American Heritage Commission
915 Capitol Mall, Room 364
Sacramento, CA 95814

Subject: Elkins Residence Survey and Testing Project, La Jolla (San Diego), California

Dear Ms. Sanchez,

Laguna Mountain Environmental is conducting an archaeological investigation in the La Jolla area of the Elkins Residence Project located at 8260 Paseo del Ocaso. The project consists of an addition to and expansion of an existing residence involving the demolition, grading, and excavation for foundations and utilities. The project area exists within the La Jolla Shores Archaeological Study Area

The approximately 0.2 acre project area is located west of Interstate 5, west of La Jolla Shores Drive, and south of the Scripps Institute of Oceanography. The project area is shown on the La Jolla 7.5' USGS quadrangle, in Township 15 South, Range 3 West, within an unsectioned portion of Pueblo Lands (see attached figure).

We respectfully request any information and input that you may have regarding Native American concerns either directly or indirectly associated with this project area. We would also appreciate a current list of appropriate Native American contacts for the area in order to elicit local concerns. If you or your files have any information about cultural resources or traditional cultural properties located on or near the project site, please contact me. If I can provide any additional information, please contact me immediately at (858) 505-8164. Thank you for your assistance.

Sincerely,

Andrew R. Pigniolo

Andrew Pigniolo, M.A., RPA
Principal Archaeologist

Attachments:
Project Location map
Sacred Lands File & Native American Contacts List Request Form

7969 Engineer Road, Suite 208 ✦ San Diego, CA 92111
Phone: (858) 505-8164 ✦ Fax: (858) 505-9658
E-Mail: Laguna@LagunaEnv.com

Sacred Lands File & Native American Contacts List Request

NATIVE AMERICAN HERITAGE COMMISSION
915 Capitol Mall, RM 364
Sacramento, CA 95814
(916) 653-4082
(916) 657-5390 – Fax
nahc@pacbell.net

Information below is Required for a Sacred Lands File Search

Project: Elkins Residence Survey & Testing Project

County San Diego

USGS Quadrangle (7.5')

Name La Jolla

Township 15S Range 3W Section(s) unsectioned

Company/Firm/Agency: Laguna Mountain Environmental, Inc.

Contact Person: Andrew Pigniolo

Street Address: 7969 Engineer Road, Suite 208

City: San Diego Zip: 92111

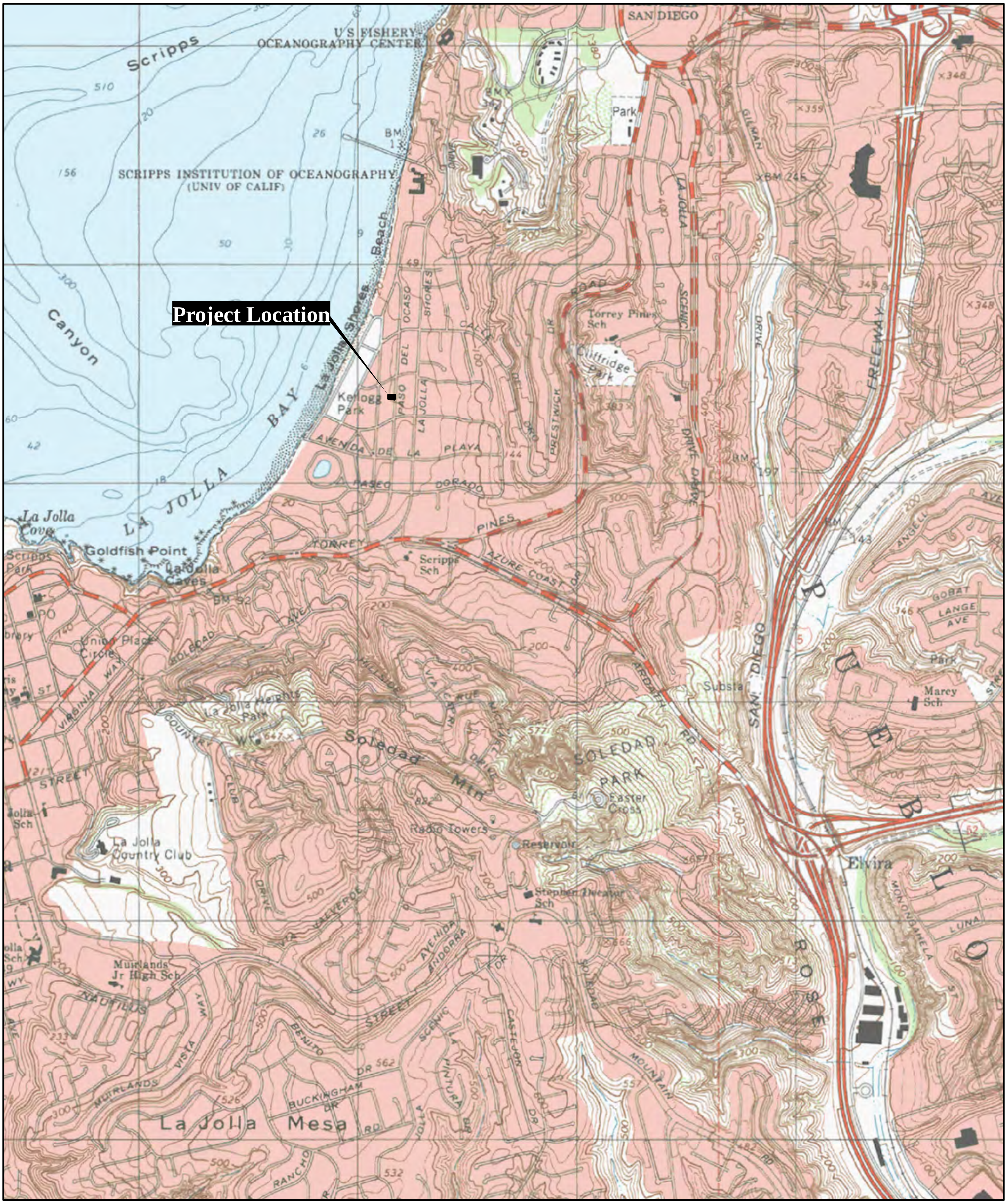
Phone: 858.505.8164

Fax: 858.505.9658

Email: Laguna@lagunaenv.com

Project Description:

The project consists of an addition to and expansion of an existing residence involving the demolition, grading, and excavation for foundations and utilities. The project area exists within the La Jolla Shores Archaeological Study Area



Source: USGS 7.5' La Jolla Quadrangle

Project Location

0 1,000 2,000 Feet

Laguna Mountain Environmental, Inc.

STATE OF CALIFORNIA Edmund G. Brown, Jr., *Governor*

NATIVE AMERICAN HERITAGE COMMISSION
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
(916) 373-3710
Fax (916) 373-5471

July 1, 2016

Andrew Pigniolo
Laguna Mountain Engineering

Sent by Email: laguna@lagunaenv.com

RE: Proposed Elkins Residence Survey & Testing Project, Community of La Jolla Shores; La Jolla USGS Quadrangle, San Diego County, California

Dear Mr. Pigniolo:

A record search of the Native American Heritage Commission (NAHC) *Sacred Lands File* was completed for the area of potential project effect (APE) referenced above with negative results. Please note that the absence of specific site information in the *Sacred Lands File* does not indicate the absence of Native American cultural resources in any APE.

I suggest you contact all of the listed Tribes. If they cannot supply information, they might recommend others with specific knowledge. The list should provide a starting place to locate areas of potential adverse impact within the APE. By contacting all those on the list, your organization will be better able to respond to claims of failure to consult. If a response has not been received within two weeks of notification, the NAHC requests that you follow-up with a telephone call to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact via email: gayle.totton@nahc.ca.gov.

Sincerely,

Gayle Totton

Gayle Totton, M.A., PhD.
Associate Governmental Program Analyst

Native American Contact List
San Diego County
June 30, 2016

Barona Group of the Capitan Grande
Clifford LaChappa, Chairperson
1095 Barona Road
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cloyd@barona-nsn.gov
(619) 443-6612

(619) 443-0681

Ewiiaapaayp Tribal Office
Robert Pinto Sr., Chairperson
4054 Willows Road
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Alpine , CA 91901
(619) 445-6315

(619) 445-9126 Fax

La Posta Band of Mission Indians
Gwendolyn Parada, Chairperson
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LP13boots@aol.com
(619) 478-2113
(619) 478-2125 Fax

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(619) 766-4957 Fax

San Pasqual Band of Mission Indians
Allen E. Lawson, Chairperson
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(760) 749-3876 Fax

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(619) 478-5818 Fax

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(619) 669-4817

This list is current only as of the date of this document and is based on the information available to the Commission on the date it was produced.

Distribution of this list does not relieve any person or agency of statutory responsibility as defined in Public Resources Code Sections 21080.3.1 Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed Elkins Residence Survey & Testing Project; Community of La Jolla Shores; La Jolla USGS Quadrangle, San Diego County, California.

Native American Contact List
San Diego County
June 30, 2016

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(760) 782-9092 Fax

Kwaaymii Laguna Band of Mission Indians
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Diegueno-Kwaaymii
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Kumeyaay Cultural Repatriation Committee
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Native American Contact List
San Diego County
June 30, 2016

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APPENDIX D

CATALOGUE

8260 Paseo del Ocaso 2016 Recovery Catalogue

Cat#	Provenie	Level (cm)	Class	Item	Type	Material/ Species	Wt (g)	Comments	Recorder/Date
1	STP-1	0-10	Instrusive	Shell	Unknown	Shell?	4.4	weathered bits	Serr (5/16/16)
2	STP-1	0-10	Instrusive	Modern	Various	Mixed	1.1	clear & faint aqua bottle glass; red brick (bits); emerald green fertilizer pellets	Serr (5/16/16)
3	STP-1	0-10	Instrusive	Modern	Nesting Material	Plastic	0.1	chewed, thin plastic wrapper	Serr (5/16/16)
4	STP-1	0-10	Instrusive	Snail Shell	-	Helix	0.1		Serr (5/16/16)
5	STP-1	10-20	Instrusive	Shell	Unknown	Shell?	0.6	weathered bits	Serr (5/16/16)
6	STP-1	10-20	Instrusive	Modern	Concrete	Other	14.9		Serr (5/16/16)
6	STP-1	10-20	Instrusive	Modern	Glass	Glass	0.2	lt. green bottle (wine?)	Serr (5/16/16)
7	STP-1	20-30	Instrusive	Modern	Concrete	Other	3.6		Serr (5/16/16)
8	STP-2	0-10	Instrusive	Modern	Brick	Other	0.3	2 small red bits	Serr (5/16/16)
9	STP-2	10-20	Faunal Bone	Bone	Large Mammal	Bone	1.0	probably modern refuse	Serr (5/16/16)
10	STP-2	10-20	Instrusive	Modern	Concrete	Other	33.7		Serr (5/16/16)
10	STP-2	10-20	Instrusive	Modern	Various	Mixed	5.0	clear & lt. green btl glass; 2 1/4" wire nail; corroded metal bits; brick bits; thin hard plastic bits	Serr (5/16/16)
11	STP-2	20-30	Faunal Bone	Bone	Large Mammal	Bone	0.4	probably modern refuse	Serr (5/16/16)
12	STP-2	20-30	Instrusive	Modern	Concrete	Other	5.4		Serr (5/16/16)
12	STP-2	20-30	Instrusive	Modern	Brick	Other	0.4		Serr (5/16/16)
13	STP-3	0-10	Instrusive	Modern	Concrete	Other	13.3		Serr (5/16/16)
13	STP-3	0-10	Instrusive	Modern	Brick	Other	80.9		Serr (5/16/16)
13	STP-3	0-10	Instrusive	Modern	Various	Mixed	1.1	tar chunks; thin bulb glass	Serr (5/16/16)
13	STP-3	0-10	Instrusive	Modern	Nesting Material	Foil	0.1	chewed	Serr (5/16/16)
14	STP-3	10-20	Instrusive	Modern	Concrete	Other	62.7		Serr (5/16/16)
14	STP-3	10-20	Instrusive	Modern	Various	Mixed	0.4	tar bits; plaster	Serr (5/16/16)
15	STP-3	20-30	Instrusive	Modern	Concrete	Other	7.0		Serr (5/16/16)
15	STP-3	20-30	Instrusive	Modern	Brick	Other	0.9		Serr (5/16/16)
16	STP-4	0-10	Faunal Shell	Shell	Bivalve	Mytilus	0.3		Serr (5/16/16)
17	STP-4	0-10	Instrusive	Modern	Concrete	Other	38.2		Serr (5/16/16)
17	STP-4	0-10	Instrusive	Modern	Various	Mixed	7.1	2 nails (one 2", one badly corroded 2 1/4"); two 1/4" dia lime green plastic "balls"; tiny brick bit; charcol chunks	Serr (5/16/16)
18	STP-4	10-20	Instrusive	Modern	Concrete	Other	15.8		Serr (5/16/16)
18	STP-4	10-20	Instrusive	Modern	Various	Mixed	5.3	1 nail (2"); red brick bits; melted lead(?); charcoal pcs	Serr (5/16/16)
19	STP-4	20-30	Instrusive	Modern	Metal	Metal	0.7	bits of corroded metal (can?)	Serr (5/16/16)
20	STP-4	30-40	Instrusive	Modern	Brick	Other	0.1	chip	Serr (5/16/16)
21	STP-5	0-10	Instrusive	Shell	Unknown	Shell?	2.0	weathered bits	Serr (5/16/16)
22	STP-5	0-10	Instrusive	Modern	Various	Mixed	0.2	red brick bit; black plastic; emerald green fertilizer pellet	Serr (5/16/16)
22	STP-5	0-10	Instrusive	Modern	Nesting Material	Plastic	0.1	chewed, thin plastic wrapper	Serr (5/16/16)
23	STP-5	10-20	Instrusive	Modern	Concrete	Other	3.1		Serr (5/16/16)
23	STP-5	10-20	Instrusive	Modern	Nails	Metal	8.7	one 2 1/4"; 2 badly corroded frags	Serr (5/16/16)
24	STP-5	20-30	Instrusive	Modern	Concrete	Other	1.5		Serr (5/16/16)
24	STP-5	20-30	Instrusive	Modern	Nails	Metal	10.6	1" roofing nail; 3 pcs of super corroded nail	Serr (5/16/16)
25	STP-6	0-10	Instrusive	Shell	Unknown	Shell?	1.0	weathered bits; is it shell?	Serr (5/16/16)
26	STP-6	0-10	Instrusive	Modern	Various	Mixed	2.5	clear, super thin glass pcs; red brick bits; solder lead; charcol chunks; small pc of concrete; narrow 3/8" bandaid; thin, red plastic; emerald green fertilizer pellets	Serr (5/16/16)
27	STP-6	10-20	Instrusive	Modern	Concrete	Other	16.1		Serr (5/16/16)
27	STP-6	10-20	Instrusive	Modern	Various	Mixed	19.4	clear, bottle glass; badly corroded metal chunks (nail?)(16.2 g); brass curtain rod end cap; emerald green fertilizer pellet	Serr (5/16/16)
28	STP-6	20-30	Instrusive	Modern	Concrete	Other	19.4		Serr (5/16/16)
28	STP-6	20-30	Instrusive	Modern	Misc.	Other	0.1	emerald green fertilizer pellet	Serr (5/16/16)
29	STP-4	Stratum 1	Soil Sample	-	-	Soil	-	Munsell 5YR 3/1 dark gray	Serr (5/16/16)
30	STP-4	Stratum 2	Soil Sample	-	-	Soil	-	Munsell 5YR 4/4 reddish brown	Serr (5/16/16)

APPENDIX E

PHOTOS AND PHOTO LOGS

State of California ç The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PHOTOGRAPH RECORD

Primary #
HRI#
Trinomial

Page 1 **of** 2

Project Name (No.): Elkins Residence Survey & Test Project (1615) **Year 2016**

Camera Format: FujiChrome
Film Type and Speed: Digital

Images Kept at: Laguna Mountain Environmental, Inc.

Mo.	Day	Time	Exp.	Subject/Description	View Toward	Accession #
5	13	7:00	01	Back Yard Overview	S-	PR-05406-001
5	13	7:00	02	Back Yard Overview	S	PR-05406-002
5	13	7:00	03	North Side of House	E	PR-05406-003
5	13	7:00	04	Front of House and Yard	NW	PR-05406-004
5	13	7:00	05	Front of House and Yard	W	PR-05406-005
5	13	7:30	06	Sewer Line Disturbance in Front Yard	SW-	PR-05406-006
5	13	7:30	07	STP#1 Surface	S-	PR-05406-007
5	13	7:30	08	STP#1 10 cm Floor	N	PR-05406-008
5	13	7:30	09	STP#1 20 cm Floor	N	PR-05406-009
5	13	8:00	10	STP#1 30 cm Floor	N	PR-05406-010
5	13	8:00	11	STP#1 30 cm Floor	N	PR-05406-011
5	13	8:00	12	STP#6 Surface	N	PR-05406-012
5	13	8:00	13	STP#6 Surface Overview	NW	PR-05406-013
5	13	8:30	14	STP#6 10 cm Floor	N	PR-05406-014
5	13	8:30	15	STP#6 20 cm Floor	N	PR-05406-015
5	13	8:30	16	STP#6 30 cm Floor	N	PR-05406-016
5	13	8:30	17	STP#6 30 cm Floor	N	PR-05406-017
5	13	8:30	18	STP#6 30 cm Floor and Sidewall	E	PR-05406-018
5	13	8:30	19	STP#6	NE	PR-05406-019
5	13	8:30	20	STP#6 30 cm Floor and Sidewall	E	PR-05406-020
5	13	8:30	21	STP#5 Surface Overview	SW	PR-05406-021
5	13	9:00	22	STP#5 Surface	N	PR-05406-022
5	13	9:00	23	STP#5 Surface	N	PR-05406-023
5	13	9:00	24	STP#5 10 cm Floor	N	PR-05406-024
5	13	9:00	25	STP#5 10 cm Floor	N	PR-05406-025
5	13	9:00	26	STP#5 20 cm Floor	N	PR-05406-026
5	13	9:30	27	STP#5 30 cm Floor	N	PR-05406-027
5	13	9:30	28	STP#5 30 cm Floor and Sidewall	E	PR-05406-028
5	13	9:30	29	STP#5 30 cm Floor and Sidewall	W	PR-05406-029
5	13	9:30	30	STP#4 10 cm Floor	N	PR-05406-030
5	13	9:30	31	STP#4 10 cm Floor	N	PR-05406-031
5	13	9:30	32	STP#4 10-20 cm Floor Soil	N	PR-05406-032
5	13	10:00	33	STP#4 20 cm Floor	N	PR-05406-033
5	13	10:00	34	STP#4 20 cm Floor	N	PR-05406-034
5	13	10:00	35	STP#4 40 cm Floor	N	PR-05406-035
5	13	10:00	36	STP#4 40 cm Floor and Sidewall	E	PR-05406-036
5	13	10:00	37	STP#4 40 cm Floor and Sidewall	W	PR-05406-037
5	13	10:30	38	STP#3 Surface	N	PR-05406-038
5	13	10:30	39	STP#3 Surface Overview	NNW	PR-05406-039
5	13	10:30	40	STP#3 10 cm Floor	N	PR-05406-040
5	13	11:00	41	STP#3 20 cm Floor	N	PR-05406-041
5	13	11:00	42	STP#3 20 cm Floor and Sidewall	W	PR-05406-042
5	13	11:00	43	STP#3 30 cm Floor and Sidewall	N	PR-05406-043
5	13	11:00	44	STP#2 Surface With Template	N	PR-05406-044
5	13	11:00	45	STP#2 Surface	N	PR-05406-045
5	13	11:30	46	STP#2 10 cm Floor	N	PR-05406-046
5	13	11:30	47	Backyard Overview	S	PR-05406-047
5	13	11:30	48	Backyard Overview	S	PR-05406-048
5	13	12:00	49	STP#2 20 cm Floor	N	PR-05406-049
5	13	12:00	50	STP#2 30 cm Floor	N	PR-05406-050
5	13	12:00	51	STP#2 30 cm Floor and Sidewall	E	PR-05406-051
5	13	12:00	52	STP#2 30 cm Floor and Sidewall	W	PR-05406-052


PR-05406-001

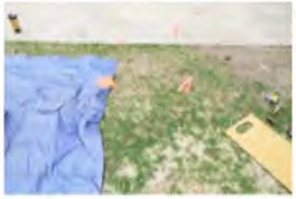

PR-05406-002


PR-05406-003


PR-05406-004


PR-05406-005


PR-05406-006


PR-05406-007


PR-05406-008


PR-05406-009


PR-05406-010


PR-05406-011


PR-05406-012


PR-05406-013


PR-05406-014


PR-05406-015


PR-05406-016


PR-05406-017


PR-05406-018


PR-05406-019


PR-05406-020


PR-05406-021


PR-05406-022


PR-05406-023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PR-05406-037


PR-05406-038


PR-05406-039


PR-05406-040


PR-05406-041


PR-05406-042


PR-05406-043


PR-05406-044


PR-05406-045


PR-05406-046


PR-05406-047


PR-05406-048


PR-05406-049


PR-05406-050


PR-05406-051


PR-05406-052

CITY OF SAN DIEGO
WATER QUALITY STUDY

Prepared by: San Diego Land Surveying and Engineering, INC.
9665 Chesapeake Drive, Suite 445, San Diego, Ca. 92123
Michael L. Smith, Project Engineer, RCE 35471

Date: JUNE 28, 2016

PROJECT SITE LOCATION: **City PTS No. 463101**

The project is located at 8260 PASEO DEL OCASO, San Diego, Ca.
Assessor's Parcel Number 346-231-17

EXISTING PROJECT SITE DESCRIPTION:

The existing site is occupied by a single family home. A portion of the site drains to the west to the rear property line and a portion drains to the east and a public street Paseo Del Ocaso. The storm runoff from the site is treated by minimal landscape area.

The impervious area of the existing site is 3503 square feet or 44.4% of the site.
See Exhibit A at the back of this report.

PROPOSED PROJECT DESCRIPTION:

The disturbed area for this project is 0.1600 acres. The existing single family home is to be removed. Earth work will consist of minor grading and compaction of the area underneath the proposed structure. One new home, pool, landscaping, hardscape and two car garage are proposed. Installation of landscaping will require minor grading on site. Off site work will be limited to the closing of the existing driveway and the construction of a new driveway. Roof drains will be directed to landscaped area that will discharge to the public street or the rear of the property.

The impervious area of the proposed site is 5,180 square feet or 65.7% of the site.
See Exhibit B at the back of this report.

Required Permanent Best Management Practices for Standard Development Projects

Source Control (SC) BMP Requirements:

SC-1: Prevent illicit discharges into the MS4

An illicit discharge is any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a National Pollutant Discharge Elimination System permit and discharges resulting from firefighting activities. Projects must effectively eliminate discharges of non-storm water into the MS4. This may involve a suite of housekeeping BMPs which could include effective irrigation, dispersion of non-storm water discharges into landscaping for infiltration, and controlling wash water from vehicle washing.

DISCUSSION:

The proposed irrigation and landscape design is done by a registered professional and will be submitted to the City of San Diego to comply with Municipal Code. It shall include flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.

SC-2: Identify the storm drain system using stenciling or signage

Storm drain signs and stencils are visible source controls typically placed adjacent to the inlets. Posting notices regarding discharge prohibitions at storm drain inlets can prevent waste dumping. Stenciling shall be provided for all storm water conveyance system inlets and catch basins within the project area. Inlet stenciling may include concrete stamping, concrete painting, placards, or other methods approved by the local municipality. In addition to storm drain stenciling, projects are encouraged to post signs and prohibitive language (with graphical icons) which prohibit illegal dumping at trailheads, parks, building entrances and public access points along channels and creeks within the project area.

Language associated with the stamping (e.g., “No Dumping-Drains to Ocean”) must be satisfactory to the City Engineer. Stamping may also be required in Spanish.

DISCUSSION:

There is no existing storm drain system. The proposed project storm drain system will be on private property and not accessible by the general public. It will consist of roof drains that discharge into landscaped areas. No stenciling or signage is required.

SC-3: Protect outdoor material storage areas from rainfall, run-on, runoff, and wind dispersal

Materials with the potential to pollute storm water runoff shall be stored in a manner that prevents contact with rainfall and storm water runoff. Contaminated runoff shall be managed for treatment incorporate the following structural or pollutant control BMPs for outdoor material storage areas, as applicable and feasible:

Materials with the potential to contaminate storm water shall be:

- Placed in an enclosure such as, but not limited to, a cabinet, or similar structure, or under a roof or awning that prevents contact with rainfall runoff or spillage to the storm water conveyance system; or
- Protected by secondary containment structures such as berms, dikes, or curbs.
- The storage areas shall be paved and sufficiently impervious to contain leaks and spills, where necessary. (continued below)
- The storage area shall be sloped towards a sump or another equivalent measure that is effective to contain spills.
- Runoff from downspouts/roofs shall be directed away from storage areas.
- The storage area shall have a roof or awning that extends beyond the storage area to minimize collection of storm water within the secondary containment area. A manufactured storage shed may be used for small containers.

DISCUSSION:

This project is the construction of a single family home. There are no outdoor material storage areas included in the design.

SC-4: Protect materials stored in outdoor work areas from rainfall, run-on, runoff, and wind dispersal
Outdoor work areas have an elevated potential for pollutant loading and spills. All development projects shall include the following structural or pollutant control BMPs for any outdoor work areas with potential for pollutant generation, as applicable and feasible:

- Create an impermeable surface such as concrete or asphalt, or a prefabricated metal drip pan, depending on the size needed to protect the materials.
- Cover the area with a roof or other acceptable cover.
- Berm the perimeter of the area to prevent water from adjacent areas from flowing on to the surface of the work area.
- Directly connect runoff to sanitary sewer or other specialized containment system(s), as needed and where feasible. This allows the more highly concentrated pollutants from these areas to receive special treatment that removes particular constituents. Approval for this connection must be obtained from the appropriate sanitary sewer agency.
- Locate the work area away from storm drains or catch basins.

DISCUSSION:

This project is the construction of a single family home. There are no materials stored in outdoor work area included in the design.

SC-5: Protect trash storage areas from rainfall, run-on, runoff, and wind dispersal
Storm water runoff from areas where trash is stored or disposed of can be polluted. In addition, loose trash and debris can be easily transported by water or wind into nearby storm drain inlets, channels, and/or creeks. All development projects shall include the following structural or pollutant control BMPs, as applicable:

- Design trash container areas so that drainage from adjoining roofs and pavement is diverted around the area(s) to avoid run-on. This can include berming or grading the waste handling area to prevent run-on of storm water.
- Ensure trash container areas are screened or walled to prevent offsite transport of trash.
- Provide roofs, awnings, or attached lids on all trash containers to minimize direct precipitation and prevent rainfall from entering containers.
- Locate storm drains away from immediate vicinity of the trash storage area and vice versa.
- Post signs on all dumpsters informing users that hazardous material are not to be disposed.

DISCUSSION:

This is a single family home; the trash storage area will be limited to the City approved trash containers that will be stored in the garage.

SC-6: Use any additional BMPs determined to be necessary by the Copermittee to minimize pollutant generation at each project site

Appendix E.1 provides guidance on permanent controls and operational BMPs that are applicable at a project site based on potential sources of runoff pollutants at the project site. The project shall implement all applicable and feasible source control BMPs listed in Appendix E.1. In addition to the source control BMPs in Appendix E.1, additional source control requirements apply for the following project types within the City jurisdiction. Guidance for implementing these additional source control requirements are presented in Appendix E.

- **SC-6A: Large Trash Generating Facilities**: Includes but are not limited to restaurants, supermarkets, "big box" retail stores serving food, and pet stores. Refer to Appendix E.20
- **SC-6B: Animal Facilities**: Includes but are not limited to animal shelters, dog daycare centers, veterinary clinics, groomers, pet care stores, and breeding, boarding, and training facilities. Refer to Appendix E.21
- **SC-6C: Plant Nurseries and Garden Centers**: Includes but are not limited to commercial facilities that grow, distribute, sell, or store plants and plant material. Refer to Appendix E.22
- **SC-6D: Automotive-related Uses**: include but are not limited to facilities that perform maintenance or repair of vehicles, vehicle washing facilities, and retail gasoline outlets. Refer to Appendix E.23

DISCUSSION:

This is a single family home, this is not a large trash generation facility, animal facility, plant nursery or for automotive related uses.

Site Design (SD) BMP Requirements:

How to comply: Projects shall comply with this requirement by using all of the site design BMPs listed in this section that are applicable and practicable to their project type and site conditions. Applicability of a given site design BMP shall be determined based on project type, soil conditions, presence of natural features (e.g. streams), and presence of site features (e.g. parking areas). Explanation shall be provided by the applicant when a certain site design BMP is considered to be not applicable or not practicable/feasible. Site plans shall show site design BMPs and provide adequate details necessary for effective implementation of site design BMPs. The "Site Design BMP Checklist for All Development Projects" located in Appendix I-5 shall be used to document compliance with site design BMP requirements.

SD-1: Maintain natural drainage pathways and hydrologic features

Maintain or restore natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams)

Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.)

During the site assessment, natural drainages must be identified along with their connection to creeks and/or streams, if any. Natural drainages offer a benefit to storm water management as the soils and habitat already function as a natural filtering/infiltrating swale. When determining the development footprint of the site, altering natural drainages should be avoided. By providing a development envelope set back from natural drainages, the drainage can retain some water quality benefits to the watershed. In some situations, site constraints, regulations, economics, or other factors may not allow avoidance of drainages and sensitive areas. Projects proposing to dredge or fill materials in Waters of the U.S. must obtain Clean Water Act Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the State must obtain waste discharge requirements. Both the 401 Certification and the Waste Discharge Requirements are administered by the San Diego Water Board. The project applicant shall consult the local jurisdiction for other specific requirements.

Projects can incorporate SD-1 into a project by implementing the following planning and design phase techniques as applicable and practicable:

- Evaluate surface drainage and topography in considering selection of Site Design BMPs that will be most beneficial for a given project site. Where feasible, maintain topographic depressions for infiltration.
- Optimize the site layout and reduce the need for grading. Where possible, conform the site layout along natural landforms, avoid grading and disturbance of vegetation and soils, and replicate the site's natural drainage patterns. Integrating existing drainage patterns into the site plan will help maintain the site's predevelopment hydrologic function.
- Preserve existing drainage paths and depressions, where feasible and applicable, to help
- Structural BMPs cannot be located in buffer zones if a State and/or Federal resource agency (e.g. SDRWQCB, California Department of Fish and Wildlife; U.S. Army Corps of Engineers, etc.) prohibits maintenance or activity in the area.

DISCUSSION:

This project is the construction of a single family home on a previously developed home site. The existing surface drainage and topography are maintained. The design of the new house conforms to the existing contours and graded pad.

SD-2: Conserve natural areas, soils and vegetation

- **Conserve natural areas within the project footprint including existing trees, other vegetation, and soils**

To enhance a site's ability to support source control and reduce runoff, the conservation and restoration of natural areas must be considered in the site design process. By conserving or restoring the natural drainage features, natural processes are able to intercept storm water, thereby reducing the amount of runoff. The upper soil layers of a natural area contain organic material, soil biota, vegetation, and a configuration favorable for storing and slowly conveying storm water and establishing or restoring vegetation to stabilize the site after construction. The canopy of existing native trees and shrubs also provide a water conservation benefit by intercepting rain water before it hits the ground. By minimizing disturbances in these areas, natural processes are able to intercept storm water, providing a water quality benefit. By keeping the development concentrated to the least environmentally sensitive areas of the site and set back from natural areas, storm water runoff is reduced, water quality can be improved, environmental impacts can be decreased, and many of the site's most attractive native landscape features can be retained. In some situations, site constraints, regulations, economics, and/or other factors may not allow avoidance of all sensitive areas on a project site. Project applicant shall consult the local municipality for jurisdictional specific requirements for mitigation of removal of sensitive areas.

Projects can incorporate SD-2 by implementing the following planning and design phase techniques as applicable and practicable:

- Identify areas most suitable for development and areas that should be left undisturbed. Additionally, reduced disturbance can be accomplished by increasing building density and increasing height, if possible.
- Cluster development on least-sensitive portions of a site while leaving the remaining land in a natural undisturbed condition.
- Avoid areas with thick, undisturbed vegetation. Soils in these areas have a much higher capacity to store and infiltrate runoff than disturbed soils, and reestablishment of a mature vegetative community can take decades. Vegetative cover can also provide additional volume storage of rainfall by retaining water on the surfaces of leaves, branches, and trunks of trees during and after storm events.
- Preserve trees, especially native trees and shrubs, and identify locations for planting additional native or drought tolerant trees and large shrubs.
- In areas of disturbance, topsoil should be removed before construction and replaced after the project is completed. When handled carefully, such an approach limits the disturbance to native soils and reduces the need for additional (purchased) topsoil during later phases.
- Avoid sensitive areas, such as wetlands, biological open space areas, biological mitigation sites, streams, floodplains, or particular vegetation communities, such as coastal sage scrub and intact forest. Also, avoid areas

that are habitat for sensitive plants and animals, particularly those, State or federally listed as endangered, threatened or rare. Development in these areas is often restricted by federal, state and local laws.

DISCUSSION:

This project is the construction of a single family home on a previously developed home site. There is minimal natural area or vegetation remaining on the site due to the construction of the existing house. Much of the existing vegetation will be preserved.

SD-3: Minimize impervious area

- **Construct streets, sidewalks or parking lots aisles to the minimum widths necessary, provided public safety is not compromised**
- **Minimize the impervious footprint of the project**

One of the principal causes of environmental impacts by development is the creation of impervious surfaces. Imperviousness links urban land development to degradation of aquatic ecosystems in two ways:

- First, the combination of paved surfaces and piped runoff efficiently collects urban pollutants and transports them, in suspended or dissolved form, to surface waters. These pollutants may originate as airborne dust, be washed from the atmosphere during rains, or may be generated by automobiles and outdoor work activities.

- Second, increased peak flows and runoff durations typically cause erosion of stream banks and beds, transport of fine sediments, and disruption of aquatic habitat. Measures taken to control stream erosion, such as hardening banks with riprap or concrete, may permanently eliminate habitat. Impervious cover can be minimized through identification of the smallest possible land area that can be practically impacted or disturbed during site development. Reducing impervious surfaces retains the permeability of the project site, allowing natural processes to filter and reduce sources of pollution.

Projects can incorporate SD-3 by implementing the following planning and design phase techniques as applicable and practicable:

- Decrease building footprint through (the design of compact and taller structures when allowed by local zoning and design standards and provided public safety is not compromised.
- Construct walkways, trails, patios, overflow parking lots, alleys and other low-traffic areas with permeable surfaces.
- Construct streets, sidewalks and parking lot aisles to the minimum widths necessary, provided that public safety and alternative transportation (e.g. pedestrians, bikes) are not compromised.
- Consider the implementation of shared parking lots and driveways where possible.
- Landscaped area in the center of a cul-de-sac can reduce impervious area depending on configuration. Design of a landscaped cul-de-sac must be coordinated with fire department personnel to accommodate turning radii and other operational needs.
- Design smaller parking lots with fewer stalls, smaller stalls, more efficient lanes.
- Design indoor or underground parking.
- Minimize the use of impervious surfaces in the landscape design.

DISCUSSION:

This project is the construction of a single family home on a previously developed home site. The proposed project will increase the impervious area by 21.3% or 1,677 square feet, compared to the existing development.

SD-4: Minimize soil compaction

• Minimize soil compaction in landscaped areas

The upper soil layers contain organic material, soil biota, and a configuration favorable for storing and slowly conveying storm water down gradient. By protecting native soils and vegetation in appropriate areas during the clearing and grading phase of development the site can retain some of its existing beneficial hydrologic function. Soil compaction resulting from the movement of heavy construction equipment can reduce soil infiltration rates. It is important to recognize that areas adjacent to and under building foundations, roads and manufactured slopes must be compacted with minimum soil density requirements in compliance with local building and grading ordinances.

Projects can incorporate SD-4 by implementing the following planning and design phase techniques as applicable and practicable:

- Avoid disturbance in planned green space and proposed landscaped areas where feasible. These areas that are planned for retaining their beneficial hydrological function should be protected during the grading/construction phase so that vehicles and construction equipment do not intrude and inadvertently compact the area.
- In areas planned for landscaping where compaction could not be avoided, re-till the soil surface to allow for better infiltration capacity. Soil amendments are recommended and may be necessary to increase permeability and organic content. Soil stability, density requirements, and other geotechnical considerations associated with soil compaction must be reviewed by a qualified landscape architect or licensed geotechnical, civil or other professional engineer.

DISCUSSION:

The proposed irrigation and landscape design is done by a registered professional and will be submitted to the City of San Diego to comply with Municipal Code. It shall include flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.

SD-5: Disperse impervious areas

Disconnect impervious surfaces through disturbed pervious areas

Design and construct landscaped or other pervious areas to effectively receive and infiltrate, retain and/or treat runoff from impervious areas prior to discharging to the MS4

Impervious area dispersion (dispersion) refers to the practice of essentially disconnecting impervious areas from directly draining to the storm drain system by routing runoff from impervious areas such as rooftops, walkways, and driveways onto the surface of adjacent pervious areas. The intent is to slow runoff discharges, and reduce volumes while achieving incidental treatment. Volume reduction from dispersion is dependent on the infiltration characteristics of the pervious area and the amount of impervious area draining to the pervious area. Treatment is achieved through filtration, shallow sedimentation, sorption, infiltration, evapotranspiration, biochemical processes and plant uptake.

The effects of imperviousness can be mitigated by disconnecting impervious areas from the drainage system and by encouraging detention and retention of runoff near the point where it is generated. Detention and retention of runoff reduces peak flows and volumes and allows pollutants to settle out or adhere to soils before they can be transported downstream. Disconnection practices may be applied in almost any location, but impervious surfaces must discharge into a suitable receiving area for the practices to be effective. Information gathered during the site assessment will help determine appropriate receiving areas.

Project designs should direct runoff from impervious areas to adjacent landscaping areas that have higher potential for infiltration and surface water storage. This will limit the amount of runoff generated, and therefore the size of the mitigation BMPs downstream. The design, including consideration of slopes and soils, must reflect a reasonable expectation that runoff will soak into the soil and produce no runoff of the DCV. On hillside sites,

drainage from upper areas may be collected in conventional catch basins and piped to landscaped areas that have higher potential for infiltration. Or use low retaining walls to create terraces that can accommodate BMPs.
Projects can incorporate SD-5 by implementing the following planning and design phase techniques as applicable and practicable:

- Implement design criteria and considerations listed in impervious area dispersion fact sheet (SD-5) presented in Appendix E.
- Drain rooftops into adjacent landscape areas.
- Drain impervious parking lots, sidewalks, walkways, trails, and patios into adjacent landscape areas.
- Reduce or eliminate curb and gutters from roadway sections, thus allowing roadway runoff to drain to adjacent pervious areas.
- Replace curbs and gutters with roadside vegetated swales and direct runoff from the paved street or parking areas to adjacent LID facilities. Such an approach for alternative design can reduce the overall capital cost of the site development while improving the storm water quantity and quality issues and the site's aesthetics.
- Plan site layout and grading to allow for runoff from impervious surfaces to be directed into distributed permeable areas such as turf, landscaped or permeable recreational areas, medians, parking islands, planter boxes, etc.
- Detain and retain runoff throughout the site. On flatter sites, landscaped areas can be interspersed among the buildings and pavement areas. On hillside sites, drainage from upper areas may be collected in conventional catch basins and conveyed to landscaped areas in lower areas of the site.
- Pervious area that receives run on from impervious surfaces shall have a minimum width of 10 feet and a maximum slope of 5%.

DISCUSSION:

This project is the construction of a single family home on a previously developed home site. The proposed project will increase the impervious area by 34.6% or 6,786 square feet, compared to the existing development. The storm water from impervious areas of the site drain onto proposed or existing landscaped area before it enters the public right of way or the adjacent property.

SD-6: Collect runoff

- **Use small collection strategies located at, or as close to as possible to the sources (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters**
- **Use permeable material for projects with low traffic areas and appropriate soil conditions**

Distributed control of storm water runoff from the site can be accomplished by applying small collection techniques (e.g. green roofs), or integrated management practices, on small sub-catchments or on residential lots. Small collection techniques foster opportunities to maintain the natural hydrology provide a much greater range of control practices. Integration of storm water management into landscape design and natural features of the site, reduce site development and long-term maintenance costs, and provide redundancy if one technique fails. On flatter sites, it typically works best to intersperse landscaped areas and integrate small scale retention practices among the buildings and paving.

Permeable pavements contain small voids that allow water to pass through to a gravel base. They come in a variety of forms; they may be a modular paving system (concrete pavers, grass-pave, or gravel-pave) or poured in place pavement (porous concrete, permeable asphalt). Project applicants should identify locations where permeable pavements could be substituted for impervious concrete or asphalt paving. The O&M of the site must ensure that permeable pavements will not be sealed in the future. In areas where infiltration is not appropriate, permeable paving systems can be fitted with an under drain to allow filtration, storage, and evaporation, prior to drainage into the storm drain system.

Projects can incorporate SD-6 by implementing the following planning and design phase techniques as applicable and practicable:

- Implementing distributed small collection techniques to collect and retain runoff
- Installing permeable pavements (see SD-6B in Appendix E)

DISCUSSION:

This project is the construction of a single family home on a previously developed home site. The small proposed site does not support bio-retentions or infiltration trenches.

SD-7: Landscape with native or drought tolerant species

All development projects are required to select a landscape design and plant palette that minimizes required resources (irrigation, fertilizers and pesticides) and pollutants generated from landscape areas. Native plants require less fertilizers and pesticides because they are already adapted to the rainfall patterns and soils conditions. Plants should be selected to be drought tolerant and not require watering after establishment (2 to 3 years). Watering should only be required during prolonged dry periods after plants are established. Final selection of plant material needs to be made by a landscape architect experienced with LID techniques. Microclimates vary significantly throughout the region and consulting local municipal resources will help to select plant material suitable for a specific geographic location.

Projects can incorporate SD-7 by landscaping with native and drought tolerant species. Recommended plant list is included in Appendix E (Fact Sheet PL).

DISCUSSION:

This project will be landscaped with native and drought tolerant species.

SD-8: Harvest and use precipitation

Harvest and use BMPs capture and stores storm water runoff for later use. Harvest and use can be applied at smaller scales (Standard Projects) using rain barrels or at larger scales (PDPs) using cisterns. This harvest and use technique has been successful in reducing runoff discharged to the storm drain system conserving potable water and recharging groundwater.

Rain barrels are above ground storage vessels that capture runoff from roof downspouts during rain events and detain that runoff for later reuse for irrigating landscaped areas. The temporary storage of roof runoff reduces the runoff volume from a property and may reduce the peak runoff velocity for small, frequently occurring storms. In addition, by reducing the amount of storm water runoff that flows overland into a storm water conveyance system (storm drain inlets and drain pipes), less pollutants are transported through the conveyance system into local creeks and the ocean. The reuse of the detained water for irrigation purposes leads to the conservation of potable water and the recharge of groundwater. SD-8 fact sheet in Appendix E provides additional detail for designing Harvest and Use BMPs. Projects can incorporate SD-8 by installing rain barrels or cisterns, as applicable.

DISCUSSION:

This project will not include harvesting of storm water. The site is to compact to efficiently use rail barrels for storm capture and use as irrigation water.

REGISTERED PROFESSIONAL ENGINEER
MICHAEL L. SMITH
R.C.E. 35471
STATE OF CALIFORNIA

MICHAEL L. SMITH, RCE 35471
My registration expires on 09-30-2016

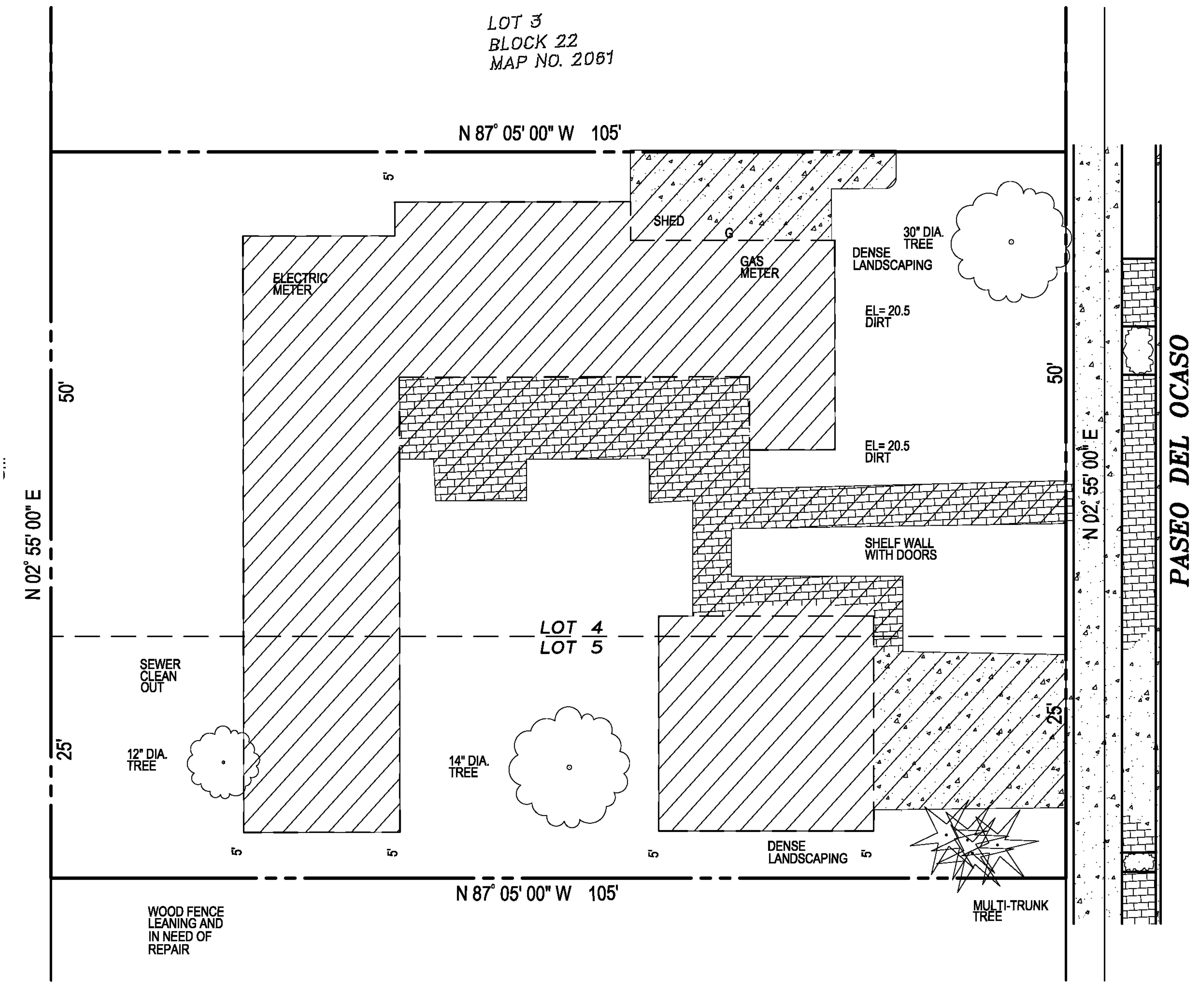

EXHIBIT A

EXISTING CONDITIONS

SCALE 1" = 10'

PROJECT AREA
AREA = 7,886 SF. OR 0.1810 AC.

IMPERVIOUS AREA
AREA = 3,503 SF. OR 0.0804 AC.
44.4% OF SITE

PERVIOUS AREA
AREA = 4,383 SF. OR 0.1006 AC.
55.6% OF SITE

IMPERVIOUS AREA ▨

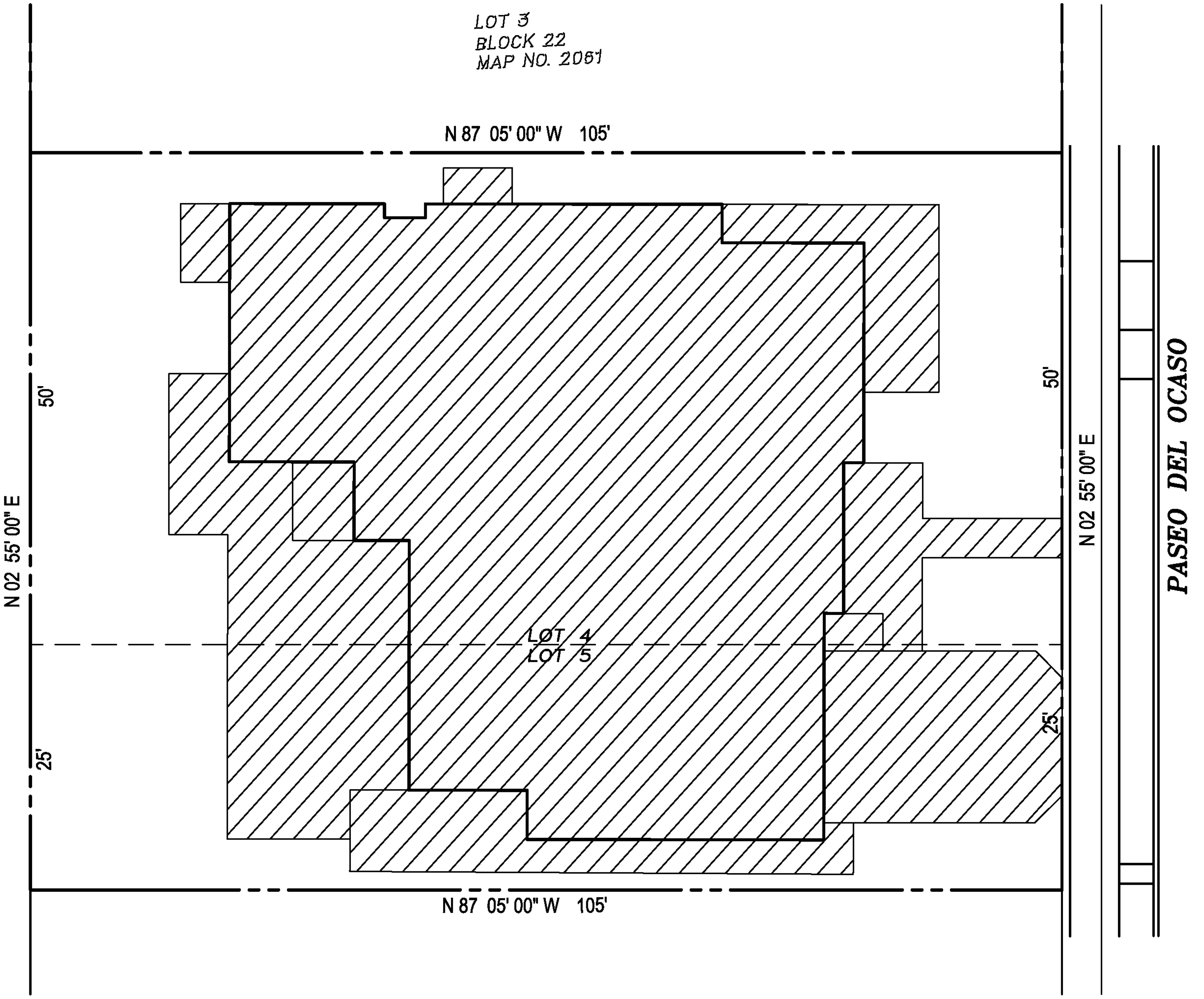

EXHIBIT B

PROPOSED CONDITIONS

SCALE 1" = 10'

PROJECT AREA
AREA = 7,886 SF. OR 0.1810 AC.

IMPERVIOUS AREA
AREA = 5,180 SF. OR 0.1189 AC.
65.7% OF SITE

PERVIOUS AREA
AREA = 2,706 SF. OR 0.0621 AC.
34.3% OF SITE

IMPERVIOUS AREA ▨

GEOTECHNICAL INVESTIGATION

Proposed Residence
8260 Paseo Del Ocaso
La Jolla, California

prepared for:

Mr. Thomas Elkins
c/o Mr. Tim Golba, Golba Architecture
1940 Garnet Avenue, Suite 100
San Diego, California 92109

by:

TerraPacific Consultants, Inc.
4010 Morena Boulevard, Suite 108
San Diego, California 92117

June 20, 2016
File No. 16055

TerraPacific
CONSULTANTS INC

Mr. Thomas Elkins
c/o Mr. Tim Golba, Golba Architecture
1940 Garnet Avenue, Suite 100
San Diego, California 92109

June 20, 2016
File No. 16055

Subject: **Geotechnical Investigation**
Proposed Residence
8260 Paseo Del Ocaso
La Jolla, California

Dear Mr. Elkins:

In accordance with our proposal dated **April 12, 2016**, TerraPacific Consultants, Inc. (TCI) has prepared the following report presenting our findings and recommendations from a geotechnical investigation at the subject property. The purpose of the investigation was to evaluate the subsurface conditions at the site and provide recommendations and geotechnical design parameters for the proposed construction. The following report contains a summary of our findings and recommendations.

We greatly appreciate the opportunity to be of service. If you should have any questions or comments regarding this report or our findings, please do not hesitate to call.

Sincerely,
TerraPacific Consultants, Inc.

Cristopher C. O'Hern, CEG 2397
Senior Engineering Geologist

CRISTOPHER C. O'HERN
No. CEG 2397
CERTIFIED ENGINEERING GEOLOGIST

Octavio Brambila, PE 70633
Project Engineer

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CCO/OB:lb

Distribution: (3) – Mr. Tim Golba, Golba Architecture

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 General

The following report presents the findings of a geotechnical investigation performed at 8260 Paseo Del Ocaso in La Jolla, California. The location of the property is presented on the Site Location Plan, Figure 1 in Appendix A. The purpose of the investigation was to evaluate the subsurface conditions at the site in order to provide recommendations and soil design parameters for the proposed residential construction, which is currently planned to consist of a two-story wood-framed residential structure with basement level and associated appurtenances.

1.2 Scope of Services

The scope of the investigation consisted of field reconnaissance, subsurface exploration, laboratory testing, and engineering and geologic analysis of the obtained data. The following tasks were performed during the investigation and production of this report:

- Site reconnaissance and review of published geologic, seismologic, and geotechnical reports and maps pertinent to the project. A list of references is provided in Appendix B;
- Logging/sampling of three small diameter borings at the subject property. The Geotechnical Plan, Figure 2 in Appendix A, presents the approximate subsurface exploration locations. The excavation logs are presented in Appendix C;
- Conduct percolation testing at four locations on-site;
- Collection of representative soil samples from selected depths within the excavations, which were transported to our laboratory for testing and analysis;
- Laboratory testing of samples collected from the test excavations. The testing included in-situ moisture and density, direct shear, expansion index, hydro-response, sulfate and chloride levels, and maximum density/optimum moisture. The laboratory data is presented in Appendix D;
- Engineering and geologic analysis of data acquired from the investigation, which provided the basis for our conclusions and recommendations; and
- Preparation of this report presenting our findings and recommendations.

2.0 PROJECT BACKGROUND

2.1 Site Description and Development History

The subject property is located at the west side of Paseo Del Ocaso in La Jolla, California. The legal description of the property is APN 346-231-1700, Lot 4 and N. 25′ Lot 5, Block 22, Map No. 2061, City of San Diego. The rectangular shaped lot is bordered by similar developed residential properties to the north, south, and west and by Paseo Del Ocaso to the east. The lot slopes very gently downwards to the west, with approximate 3 feet of total relief and an approximate elevation ranging from 20 feet to 23 feet mean sea level (MSL). The lot is currently improved with a single-family residential structure and associated appurtenances. The date of initial site development is reportedly circa 1950.

2.2 Proposed Development

Based on our review of the current architectural plans, it is our understanding that the current structure is to be razed and a new two-story single-family residence with a basement level and associated appurtenances will be constructed.

3.0 SITE INVESTIGATION

The site investigation was conducted on May 6, 2016 and consisted of visual reconnaissance and subsurface exploration. The purpose of the investigation was to gain an understanding of the site configuration and subsurface conditions in the vicinity of the proposed construction.

3.1 Site Reconnaissance

Our site reconnaissance consisted of walking the site to determine if any indications of adverse geologic conditions were present. No outward signs of distress indicating adverse geologic conditions were noted.

3.2 Subsurface Exploration

The subsurface exploration consisted of three small diameter borings, which were excavated with either a truck mounted drill rig or a limited access tri-pod rig. The borings, B-1 through B-3, were excavated in the approximate areas of planned improvements to respective final depths of 33.0, 13.5, and 9.5 feet below ground surface (bgs). The approximate excavation locations are presented on the Geotechnical Plan, Figure 2 in Appendix A. The borings were logged and sampled by licensed professionals from our office.

In general, the subsurface exploration revealed that the site is mantled by shallow fill, which is underlain by native older paralic deposits. Groundwater was encountered within Boring B-1 at an approximate depth of 18 feet (bgs). Borings B-2 and B-3 did not encounter groundwater. Descriptions of each material are detailed in Section 4.2 Site Stratigraphy and the subsurface excavation logs are provided in Appendix C.

3.3 Laboratory Testing

Soil samples collected during the field exploration were transported to our laboratory for testing. The purpose of the testing was to characterize the soil types and evaluate the engineering properties of the soil. The laboratory testing included in-situ moisture and density, expansion index, direct shear, hydro-response, sulfate and chloride levels, and maximum density/optimum moisture. Each of the laboratory tests were performed in accordance with ASTM specifications or other accepted testing procedures. The results of the laboratory tests are presented in Appendix D.

4.0 SITE GEOLOGY

4.1 Geologic Setting

The site is located within the coastal portion of the Peninsular Ranges Geomorphic Province of California. This province, which extends 900 miles from Southern California to the southern tip of Baja California, is characterized by northwest-trending structural blocks. The coastal portion of the province in San Diego County is typically comprised of upper Cretaceous-aged to Tertiary-aged (1.8 million to 65 million years) marine and non-marine sedimentary bedrock units that have been deposited within a northwest-trending basin known as the San Diego Embayment (Norris & Webb, 1976). Recent geologic uplift along the San Diego coastal margin, combined with sea level changes, have created marine terraces and associated deposits consisting of near-shore marine, beach estuarine, and lagoonal facies. These deposits range from early to mid Quaternary-aged (45,000 to 1.5 million years) and are designated in geologic literature as paralic deposits.

According to the geologic literature, the site is underlain by Quaternary-aged surficial deposits designated young alluvial flood plain deposits. Surficial deposits designated as Old Paralic Deposits, Unit 6 are mapped approximately 300 feet east of the site. Our investigation indicates the site is underlain by the Old Paralic Deposits. Geologic literature describes the paralic deposits as “poorly sorted, moderately permeable, reddish-brown, interfingered strandline, beach, estuarine and colluvial deposits composed of siltstone, sandstone, and conglomerate” (Kennedy and Tan, 2008).

Based on the City of San Diego Seismic Safety Study Map, the site is located within a Zone 52 – “other level areas, gently sloping to steep terrain, favorable geologic structure, low risk.” The site is located on the Geologic Map, Figure 3 in Appendix A, and the Seismic Safety Study Map, Figure 4 in Appendix A.

4.2 Site Stratigraphy

The subsurface descriptions presented below are interpreted from the conditions exposed during the field investigation and/or inferred from local geologic literature. Geologic Cross Sections A-A′ and B-B′, Figures 5 and 6 in Appendix A, graphically depict the site stratigraphy. In addition to the following descriptions, detailed exploration logs are presented in Appendix C.

Fill Soil - Fill soil is earth material that has been placed using mechanical means such as dozers or other large earthmovers. Typically, the fill soil has been removed from topographically high locations and placed in low-lying areas to create level building pads. When properly compacted, fill soil can be used to support structures. However, it is typically more compressible than natural formational soils.

Shallow fill soils were encountered in each of the borings, B-1 through B-3, from the ground surface to respective depths of 2.7, 2.5, and 2.5 feet (bgs). The fill soils were relatively consistent, and were generally described as a medium red brown to yellow brown, loose to medium dense, slightly moist to moist, silty sand.

Native Surficial Deposits - Old Paralic Deposits, Unit 6 (Qop6) - Terrace deposits designated Quaternary-aged Old Paralic Deposits, Unit 6 were encountered in each of the borings underlying the fill material. The paralic deposits are associated with the Nestor marine terrace and are approximately 120,000 years old. The material encountered during our exploration was generally described as a pale medium to gray brown to yellow brown sandy silty sandstone that was slightly moist to wet and dense in consistency.

4.3 Groundwater

Static groundwater was encountered within Boring B-1 at a depth of 18 feet bgs at the time of drilling. A temporary standpipe was installed within the boring for temporary future monitoring. Measurements taken after drilling and on June 16, 2016 indicate consistent groundwater depths of approximately 18 feet bgs for the lot. Borings B-2 and B-3, which extended to respective depths of 13.5 and 9.5 feet bgs, did not encounter groundwater. The anticipated depth to any high seasonal groundwater is expected to be on the order of 15 feet bgs. It should be mentioned that transient perched groundwater conditions can develop at different levels within the soil profile due to future irrigation patterns, periods of prolonged rainfall, and/or other conditions related to off-site development.

5.0 SEISMICITY

5.1 Regional Seismicity

Generally, the seismicity within California can be attributed to the regional tectonic movement taking place along the San Andreas Fault Zone, which includes the San Andreas Fault and most parallel and sub-parallel faulting within the state. A majority of Southern California, which includes the subject site, is considered seismically active. Seismic hazards can be attributed to potential ground shaking from earthquake events along nearby faults or more distant faulting.

According to regional geologic literature, the closest known active faults are located within the Rose Canyon Fault Zone. The Rose Canyon Fault Zone consists of a complex zone of several en echelon strike slip, oblique, reverse, and normal faults, which extend onshore in this area from San Diego Bay north to La Jolla Bay. Several other potentially active and pre-Quaternary faults also occur within the regional vicinity. Currently, the geologic literature presents varying opinions regarding the seismicity of these faults. As such, the following seismic analysis only considers the effects of nearby faults currently considered active.

5.2 Probabilistic Ground Acceleration

A deterministic seismic hazard analysis was performed for the site using the computer program EQFault (Blake, 2000). The analysis considers the maximum movement magnitude earthquake for active faults within the specified search radius to provide a maximum expected earthquake event for the known tectonic structure. For this site, we specified a search radius of 62.4 miles (100 km) and the conservative attenuation equation of Campbell & Bozorgnia (1997 Rev.) for alluvium. The results of the analysis for the faults most likely to affect the site are presented in Appendix E, Summary of Active Faults.

In addition to the deterministic analysis, a simplified probabilistic seismic hazard analysis was performed for the site. The California Geological Survey has a webpage that allows a user to calculate the ground motion at a site with both a 2 percent and 10 percent probability of exceedance in a 50-year period. The results of the output indicated the site had respective calculated peak ground accelerations of 0.585g and 0.266g.

The values provided above are for comparing the potential for seismic shaking due to fault activity most likely to affect the site. Other factors should be considered when completing seismic design, such as duration of shaking, period of the structure, design category, etc. The design and/or structural engineer should consider the information provided herein and evaluate the structure(s) in accordance with the California Building Code (CBC) and guidelines of the City of San Diego. The earthquake design parameters based on the 2013 CBC applicable to the site are provided in Section 7.6.

5.3 Hazard Assessment

Faulting/Fault Rupture Hazard - An “active” fault as defined by the Alquist-Priolo Earthquake Fault Zoning Act is a fault that has had surface rupture within Holocene time (the past 11,000 years). A “potentially active” fault is defined as any fault that showed evidence of surface displacement during Quaternary time (last approximate 1.6 million years), but not since Holocene time.

According to the City of San Diego Seismic Safety Study 2008 and the Quaternary Fault Map from the USGS Earthquake Hazards Program, the subject parcel is located approximately 0.5 miles northeast of an "active" portion of the Rose Canyon Fault Zone. The Scripps Fault and several other unnamed faults are mapped nearby. These faults are considered to be older than Quaternary-aged and are classified on the City Map as "potentially active, inactive, presumed inactive or activity unknown." The site is not located within an Alquist-Priolo Fault Zone, and according to geologic literature, is not intersected by any faults. The site is depicted on the Seismic Safety Study Map, Figure 4 in Appendix A.

Seismically Induced Settlement - Within the depths of our exploration, the soils encountered consisted of predominately medium to coarse grained, dense, native soils. Based on the anticipated earthquake effect and the stratigraphy of the site, seismically induced settlement is expected to be minor and within tolerable limits. Structures that are designed and constructed in accordance with applicable building codes are expected to perform well with respect to settlement associated with predictable seismic events.

Liquefaction - Liquefaction involves the substantial loss of shear strength in saturated soil, usually taking place within a saturated medium exhibiting a uniform fine grained characteristic, loose consistency, and low confining pressure when subjected to impact by seismic or dynamic loading. Based on the relatively dense nature of the underlying native paralic deposits the site is considered to have a negligible risk for liquefaction.

Lurching and Shallow Ground Rupture - Rupturing of the ground is not likely due to the absence of known active fault traces within the project limits. Due to the generally active seismicity of Southern California; however, the possibility for ground lurching or rupture cannot be completely ruled out. In this light, "flexible" design for on-site utility lines and connections should be considered.

Landsliding - Given the shallow topographic relief of the site and surrounding area, the possibility for landsliding is believed to be remote. Furthermore, the San Diego Seismic Safety Study does not depict any known landslides in the vicinity of the site.

Seiches and Flooding - At the time of our investigation, there were no nearby contained bodies of water that could produce seiches ("tidal" waves in confined bodies of water) that may affect the site. No seiche or flooding potential was identified.

Tsunamis - Tsunamis are great sea waves produced by seismic events. Given the close proximity of the subject site to the Pacific Ocean (approximately 750 feet) and the site elevation (estimated low point at 20 feet MSL), it is possible that a tsunami could impact the site. Historically, the magnitudes of tsunamis to impact the San Diego coastline have been fairly small, typically less than 1 meter in height. Recent studies into the possibility of offshore seismic events triggering tsunamis via fault movement or undersea landslides has experts of the opinion that Southern California is not free from tsunami risks (Krier, 2005). However, predicting the level of risk is difficult, due to the lack of knowledge about the offshore fault system. In our opinion, there is no practical approach for mitigating the potential impact to the site from a tsunami. This is an inherent risk for those living within the beach area. The homeowner(s) should have an evacuation plan in place for a strong seismic event (i.e. typically 20 seconds or more of sturdy ground shaking) or when an official tsunami warning is issued.

6.0 CONCLUSIONS

Based on the results of our geologic reconnaissance and subsurface exploration, it is our opinion that the proposed development is feasible from a geotechnical standpoint, provided the recommendations presented in the following sections are adopted and incorporated into the project plans and specifications.

The following sections provide recommendations for the proposed site development. The civil and/or structural engineer should use this information during the planning and design of the proposed construction. Once the plans and details have been prepared, they should be forwarded to this office for review and comment.

A key aspect of the proposed development is the planned transitional structural footprint, which will span both the basement and on-grade portions of the foundations. As a means to limit potential transitional effects on the structure, it is recommended that remedial grading be conducted to provide a uniform 24-inch thick fill mat under the bottom of the proposed foundation bottoms. Alternatively, the foundations can be founded a minimum depth of 12 inches into competent paralic deposits. Due to the presence of paralic deposits at a relatively shallow depth, the basement level will extend well into this material; however, the on-grade portions of the structure (i.e. garage and patio) will likely require deepened footings to accomplish this. Remedial grading would still be required in these areas as well.

7.0 RECOMMENDATIONS

The following sections provide our recommendations for site preparation, design, and construction of the proposed foundation systems. Once the plans and details have been prepared, they should be forwarded to this office for review and comment.

7.1 Site Preparation and Grading

In order to prepare the site for the new construction, it is assumed that all of the existing improvements will be demolished and removed from the site. However, if unsuitable materials (i.e. construction debris, plant material, etc.) are encountered during the grading phase, they should be removed and properly disposed off-site.

As previously mentioned, grading would be conducted to provide a uniform fill mat for all structures. This will require removals and/or over-excavations to expose competent paralic deposits, or extend a minimum of 24 inches below proposed foundation bottom deposits, whichever is deeper. The removals should extend a minimum of 5 feet beyond the structural footprint, unless limited by property line constraints, and into the competent older native paralic deposits. It is anticipated that temporary shoring will be required for the site grading and/or basement excavations. Temporary shoring recommendations are provided in Section 7.4.

In areas where less critical structures such as site walls, driveways, and walkway slabs are proposed, it is recommended that the upper approximate 18 inches of existing soil be moisture conditioned and recompacted. This will help provide a more uniform bearing support for these types of appurtenant structures.

Once the removal bottoms have been established, the bottoms should be scarified a minimum of 6 inches, moisture-conditioned, and compacted to 90 percent relative compaction.

The on-site soil, less any organic debris, may be used for fill, provided that it is placed in thin lifts (not exceeding 8 inches in loose thickness). All soil should be properly moisture conditioned and mechanically compacted to a minimum of 90 percent of the laboratory maximum dry density per ASTM D-1557 and at or slightly above optimum moisture condition. The removal bottoms, fill placement, and compaction should be observed and tested by the geotechnical consultant. Standard guidelines for grading are provided in Appendix G.

7.2 Temporary Excavations

Foundation excavations, utility trenches, or other temporary vertical cuts may be conducted in compacted engineered fill or formational soils to a maximum height of 4 feet. Any temporary cuts beyond the above height restraint could experience sloughing or caving and, therefore, should either be shored or laid-back. Laid-back slopes should have a maximum inclination of 1:1 (horizontal:vertical) and not exceed a vertical height of 10 feet without further input from the geotechnical consultant. In addition, no excavation should undercut a 1:1 projection below the foundation for any existing improvements, i.e. existing building foundations both on and off-site. Regional safety measures should be enforced and all excavations should be conducted in strict accordance with OSHA guidelines.

Excavation spoils should not be stockpiled adjacent to excavations as they can surcharge the soils and trigger failure. In addition, proper erosion protection, including runoff diversion, is recommended to reduce the possibility for erosion of slopes during grading and building construction. Ultimately, it is the contractor’s responsibility to maintain safe working conditions for persons on-site.

7.3 Foundation Recommendations

The following sections provide the soil parameters and general guidelines for foundation design and construction. It is anticipated that all new construction will be supported by conventional continuous and spread footings. As mentioned previously, the new foundations should be supported on competent engineered fill in accordance with Section 7.1. Alternatively, foundations extending a minimum of 12 inches into competent native paralic deposits, as outlined in Section 6.0, can be constructed. However, areas of localized remedial grading would still be required for on-grade portions of the structural footprint. Additionally, deepened footings to significant depths could be required. If additional parameters are desired, they can be provided on request.

The foundation design parameters and guidelines that are provided below are considered to be "minimums" in keeping with the current standard-of-practice. They do not preclude more restrictive criteria that may be required by the governing agency or structural engineer. The architect or structural engineer should evaluate the foundation configurations and reinforcement requirements for structural loading, concrete shrinkage, and temperature stress.

7.4 Soil Design Criteria

The following separate soil design criteria are provided for design and construction of the conventional foundations for light building structures. The parameters that are provided assume foundation embedment in competent engineered fill material with an expansion index classification as "low."

Conventional Foundations

Allowable bearing capacity for square or continuous footings	2,500 psf
Minimum embedment in competent engineered fill or paralic deposits	18 in
Minimum width for continuous footings	15 in
Minimum width for square footings	2.5 ft

Note: The bearing capacity value may be increased by one-third for transient loads such as wind and seismic. In addition, the value provided may be increased by 500 psf for each additional foot of width or depth beyond the minimums provided. The increased bearing capacity should not exceed 5,000 psf.

Coefficient of friction against sliding	0.35
Passive resistance	300 psf/ft up to a maximum of 2,500 psf

Soldier Pile Temporary Shoring (Cantilevered)

Allowable bearing capacity for temporary soldier pile shoring	8,000 psf

Note: The bearing capacity provided is a net value after down drag and concrete weight are taken into account.

Minimum embedment in competent paralic deposits ....5 ft

Note: All embedments should be verified in the field by the soil engineer prior to placement of reinforcing steel.

Minimum width or diameter for piles ....2 ft

Active pressure for level ground surface at top of excavation..............................30 psf/ft

Structural surcharge from adjacent footings .... 0.43x (footing load)

Note: Apply surcharge to portion of retaining wall below 1:1 projection from base of overlying footing.

Passive resistance in competent paralic deposits ....350 psf/ft

Note: Passive resistance may be applied in a tributary fashion over two pile diameters from the elevated ground surface to the base of the pile.

7.5 Retaining Walls

Lateral Loading and Resistance Parameters

For retaining walls, the bearing capacity and foundation dimensions provided for Section 7.4 may be followed. Additional design parameters for lateral loading and resistance are provided below:

Active earth pressure for level backfill (non-restrained walls)...............................35 psf/ft

At rest earth pressure for level backfill (restrained walls) ....60 psf/ft

Note: The active and at-rest pressures are provided assuming importing granular soil is used for backfill. Backfill and subdrain recommendations are provided in the following sections.

Passive resistance in competent fill ....300 psf/ft

Coefficient of friction against sliding 0.35

Note: The passive resistance and coefficient of friction may be used in combination if there is a fixed structure, such as a floor slab over the toe of the retaining wall. If the two values are used in combination, the passive resistance value should be reduced by one-third.

Earthquake Loads

Seismic loading for retaining walls with level backfill should be approximated by applying a 18 psf/ft in an inverse triangle shape where the lateral force at the bottom of the wall is equal to zero and the lateral force at the top of the retaining wall is equal to 18 psf times the height of the wall. The resultant seismic load should be applied from the bottom of the wall a distance of 0.6 times the overall height of the wall.

The seismic loads would be in addition to the normal earth pressure loads applied on the retaining walls, which are provided above. The structural engineer should evaluate the overall height of the wall and apply the appropriate retaining wall loading parameters to be used for analysis and design.

7.6 Earthquake Design Parameters

Earthquake resistant design parameters may be determined from the California Building Code (2013 Edition). Based on our investigation and characterization of the site, the following design parameters may be adopted:

Site coordinates	Latitude: 32.8564, Longitude: -117.2549
Site classification	D
Site coefficient Fa	1.000
Site coefficient Fv	1.500
Spectral response acceleration at short periods Ss	1.298
Spectral response acceleration at 1-second period S1	.0.504
Maximum spectral response accelerations at short periods Sms	1.298
Maximum spectral response accelerations at 1-second period Sm1	0.756
Design spectral response accelerations at short periods Sds	0.866
Design spectral response accelerations at 1-second period Sd1	0.504

7.7 Foundation and Retaining Wall Design Guidelines

The following guidelines are provided for assistance in the design of the various foundation elements and are based on the anticipated low expansion potential of the bearing soils. As is always the case, where more restrictive, the structural and/or architectural design criteria should take precedent.

Foundations - Continuous footings for the buildings should be a minimum of 18 inches deep. Reinforcement should consist of a minimum four No. 5 rebar, two placed at the top and two at the bottom of the footing. All footing embedments should be verified by the soil engineer.

Slabs-on-Grade - Interior and exterior slabs-on-grade should be a minimum of 5 inches thick (net) and reinforced with No. 4 rebar placed at a maximum spacing of 18 inches on center, both ways. The steel reinforcement should be placed at the mid point or slightly above the mid point in the slab section. For exterior slabs, control joints should be installed at a maximum spacing of 10 feet in each direction. Prior to construction of slabs, the subgrade should be moistened to approximately 12 inches in depth at least 24 hours before placing the concrete. Exterior slabs that will abut soil or planter areas should be constructed with a 12-inch thick by 12-inch wide thickened edge to help mitigate lateral moisture migration. The above recommendations are considered minimums for the site soil. In the case of the pool/spa deck, the designer should provide actual slab thickness, reinforcement, underlayment, and concrete strength recommendations.

All interior floor slabs should be underlain by 2 inches of clean sand followed by a minimum 15-mil PVC vapor retarder (Stego Wrap or similar). The vapor retarder should be further underlain by a 4-inch thick layer of gravel or crushed rock. Also, the vapor retarder should be properly lapped and sealed around all plumbing penetrations. Exterior driveway slabs should be underlain by 4 inches of Class II base.

Retaining Walls - Retaining walls should be provided with a gravel subdrain system. The drain system should start with a minimum 4-inch diameter perforated PVC Schedule 40 or ABS pipe, which is placed at the heel of the wall footing and below the adjacent slab level. The pipe should be sloped at least 1 percent to a suitable outlet, such as an approved site drainage system or off-site storm drain. The pipe should be surrounded by a gravel backfill consisting of tamped $^3/_4$-inch sized gravel. This gravel backfill zone should be a minimum of 12 inches wide and should extend from slightly below the drain pipe up to approximately two-thirds of wall height. The entire gravel section should be wrapped in a filter cloth such as Mirafi 140 NS or similar to prevent contamination with fines. Alternatively, walls can be drained using geo-composite panel drains that connect to a gravel sub-drain at the heel of the wall. In addition, the wall should be properly moisture proofed per the project architect. See the Retaining Wall Drain Details, Figure 7 in Appendix A.

Foundation and Slab Concrete - The results of the corrosion tests indicate negligible levels of sulfates and chlorides within the on-site soils. However, given the relative proximity to the ocean, it is recommended that the concrete used for foundation elements contain Type V cement. The concrete should be mixed and placed in accordance with ACI specifications. Water should not be added to the concrete at the site, as this can reduce the mix and lead to increased porosity and shrinkage cracking.

Proper curing techniques and a reduction in mixing water can help reduce cracking and concrete permeability. In order to further reduce shrinkage cracking and slab permeability, consideration should be given to using a concrete mix that possesses a maximum water cement ratio of 0.5.

Appurtenances - Other site appurtenances such as planter walls, site walls, etc., can be constructed on continuous footings. Footings for such appurtenances should be a minimum of 18 inches deep, 12 inches wide, and minimally reinforced with four No. 4 bars, two top and two bottom. The bearing capacity for such appurtenances is 1,500 psf.

7.8 Trench Backfill

Trench excavations for utility lines should be properly backfilled and compacted. Utilities should be properly bedded and backfilled with clean sand or approved granular soil to a depth of at least 1-foot over the pipe. This backfill should be uniformly watered and compacted to a firm condition for both vertical and lateral pipe support. The remainder of the backfill may be typical on-site soil or low expansive import placed near optimum moisture content in lifts not exceeding 8 inches in thickness and mechanically compacted to at least 90 percent relative compaction.

7.9 Site Drainage

Drainage should be designed to direct surface water away from structures and on to an approved disposal area. For earth areas, a minimum gradient of 2 percent should be maintained, with drainage directed away from slopes and towards approved swales or collection facilities. In order to reduce saturation of the building foundation soils, positive drainage should be maintained within an away gradient of at least 5 percent for a minimum distance of 10 feet from foundations. Where property line constraints prohibit this distance, a 5 percent gradient to an approved drainage diversion (i.e. area drains or swales) should be provided. Impervious surfaces within 10 feet of the building foundation should be sloped a minimum of 2 percent away from the building. Drainage patterns approved after grading should be maintained throughout the life of the development. In addition, it is recommended that roof gutters be installed with downspouts that are tied into the yard drain system.

7.10 Storm Water Infiltration / Percolation BMPs

As a part of our geotechnical investigation, and in accordance with the City of San Diego Storm Water Standards, January 2016 edition, percolation testing was conducted on-site. The open pit testing was conducted on May 5, 2016 at four locations across the site, P-1 through P-4, at pre-selected locations by the project civil engineer at depths ranging from 26 inches to 31 inches below grade. The test locations are presented on the Geotechnical Plan, Figure 2 in Appendix A. The testing was conducted in accordance with the County of San Diego Percolation Test Procedure, percolation rates were converted to infiltration rates using the Porchet Method and indicated the following results:

Percolation Test No.	Percolation Test Result Inches Per Hour	Infiltration Result Inches Per Hour
P-1	≥ 36	7.2
P-2	20.25	4.1
P-3	≥ 36	7.2
P-4	≥ 36	7.2

The testing results indicate that the site is suitable for full infiltration based on the guidelines set by the Storm Water Standards. The lack of shallow groundwater (i.e. greater than 10-foot depth) and proposed residential use will likely not cause adverse impacts to groundwater quality; however, the risk for potential contamination cannot be completely ruled out, as such bio-swales with appropriate filtering mechanisms should be properly designed. A review of the site utilizing the Geotracker website indicates the site is not within a groundwater basin and is not within 1,000 feet of any current or historic environmentally contaminated areas. The web soil survey USDA website indicates the site as within a Type C soil group and not within an area of hydric soils.

The project civil engineer should evaluate the feasibility of using infiltration on-site and any necessary factor of safety to be applied to the measured percolation rate used in design of such a system. As is always the case, the addition of on-site infiltration systems may have a negative impact to surrounding proposed or existing structures or improvements due to the increased soil saturation levels. To minimize the potential for adverse impacts, it is recommended that if infiltration is to be used, the system be placed an adequate distance away from any structures and incorporate some form of overflow protection that outlets/connects to an off-site drain system.

The relatively flat terrain, lack of on-site slopes, and homogeneous near surface soil types, as identified during our subsurface investigation, indicate that the anticipated flow path of infiltrated water would primarily occur in a downward direction. Soil piping, daylight water seepage, ground settlement, or slope instabilities are not expected to occur as a result of the proposed partial infiltration. However, as indicated above, the potential for infiltrated water and resultant saturated soils to impact flatwork or pavement sections, utility trench bedding, any subsurface drain systems, or other improvements cannot be completely ruled out, as such the locations of these items in relation to the proposed infiltration areas should be properly evaluated during project design.

The measured site-specific percolation rates for the site indicated infiltration rates ranging from 7.2 inches per hour to 4.1 inches per hour. These rates are relatively consistent with published rates for sandy type soils as indicated in USDA, 2008. In accordance with the County of San Diego Percolation Testing Manual, the lower rate of 4.1 inches per hour should be utilized for design purposes. This infiltration is also considered the maximum allowable rate that would not significantly increase the potential for damage to existing or proposed structures; however, this potential cannot be completely ruled out. The Storm Water Standards Worksheet C.4-1 is provided in Appendix F.

7.11 Plan Review and Geotechnical Observation

When the grading and foundation plans are completed, they should be reviewed by TCI for compliance with the recommendations herein. Observation by TCI, or another company's geotechnical representative is essential during grading and/or construction to confirm conditions anticipated by the preliminary investigation, to adjust designs to actual field conditions, and to determine that grading is conducted in general accordance with our recommendations. In addition, all foundation excavations should be reviewed for conformance with the plans prior to the placement of forms, reinforcement, or concrete. Observation, testing, and engineering consulting services are provided by our firm and should be budgeted within the cost of development.

8.0 CLOSURE

8.1 Limits of Investigation

Our investigation was performed using the skill and degree of care ordinarily exercised, under similar circumstances, by reputable soils engineers and engineering geologists practicing in this or similar localities. No warranty, expressed or implied, is made as to the conclusions and professional advice in this report. This report is prepared for the sole use of our client and may not be assigned to others without the written consent of the client and TCI.

The samples taken and used for testing, and the observations made, are believed representative of the site conditions; however, soil and geologic conditions can vary significantly between test excavations and surface exposures. As in most projects, conditions revealed by construction excavations may vary with the preliminary findings. If this occurs, the geotechnical engineer should evaluate the changed conditions and adjust recommendations and designs, as necessary.

This report is issued with the understanding that it is the responsibility of the owner, or of his representative, to ensure that the information and recommendations contained herein are brought to the attention of the project architect and engineer. Appropriate recommendations should be incorporated into the structural plans and the necessary steps taken to see that the contractor and subcontractors carry out such recommendations in the field.

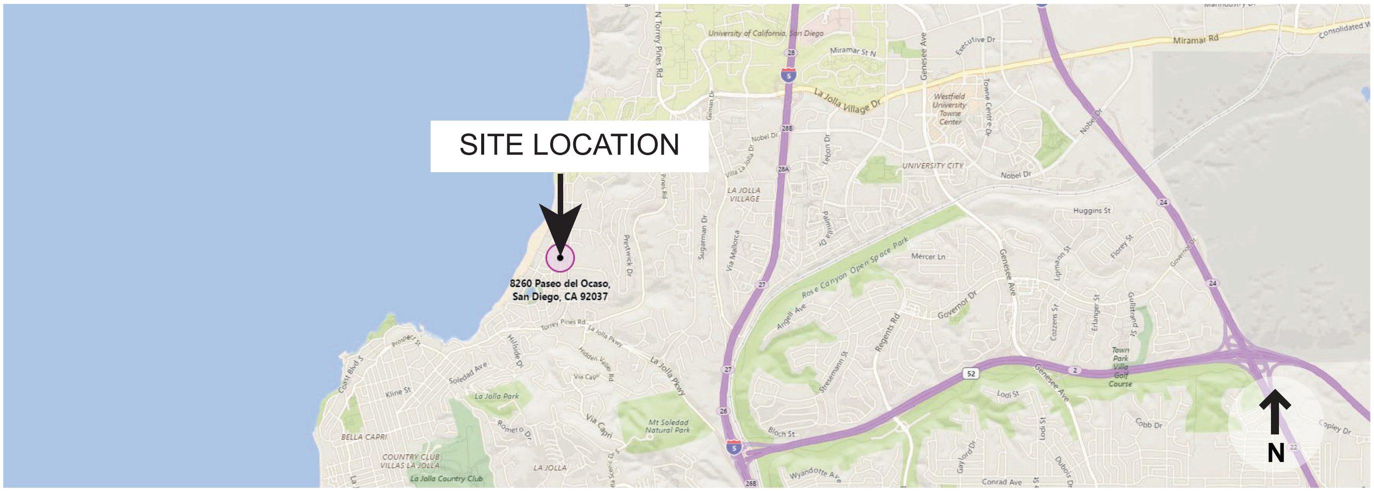
The findings of this report are valid as of the present date. However, the conditions can change with the passage of time, whether they are due to natural processes or the works of man. In addition, changes in applicable or appropriate standards may occur from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated wholly or partially by changes outside of our control. This report is subject to review and should be updated after a period of 3 years.

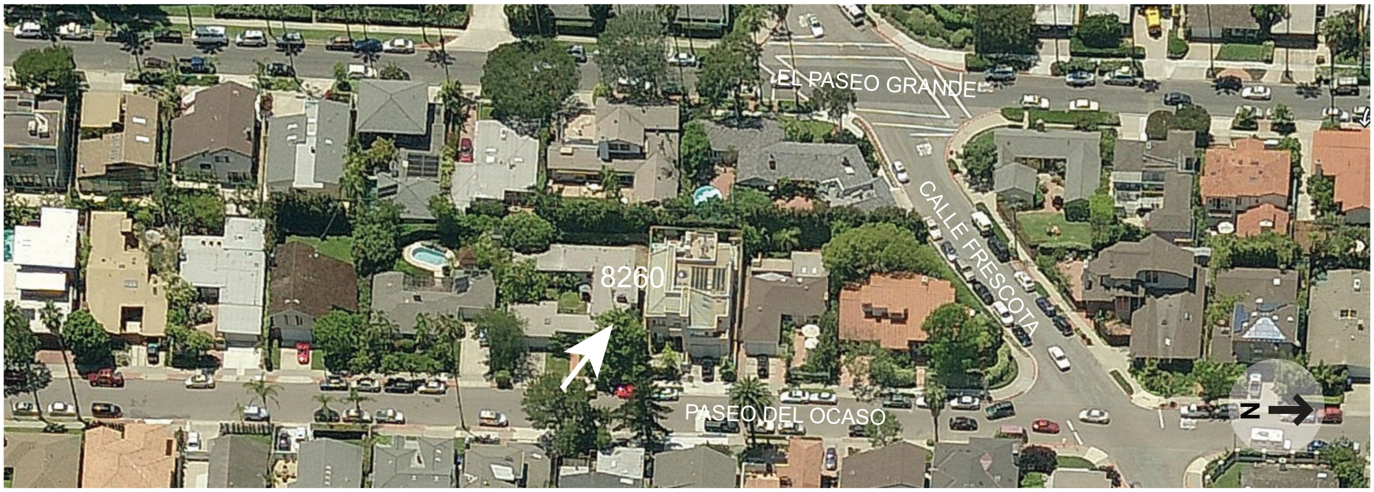
*** * * TerraPacific Consultants, Inc. * * ***

APPENDIX A

Figures

LOCATION:
8260 Paseo del Ocaso
San Diego, California

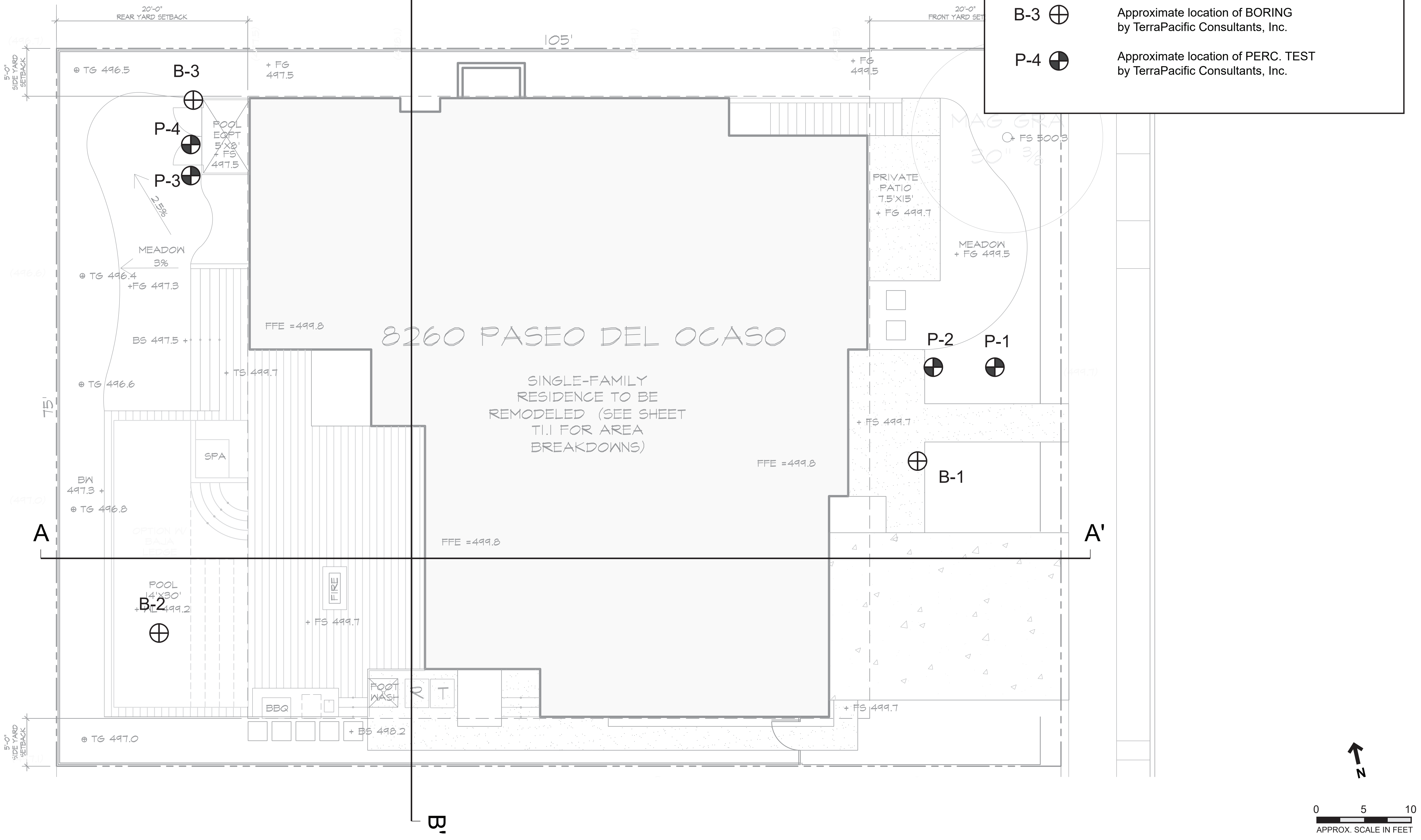




REFERENCE: Bing Maps

TerraPacific CONSULTANTS INC 4010 Morena Boulevard Suite 108 San Diego CA 92117 858-521-1190	***Site Location Plan***	*Elkins Residence* File No. 16055 June 2016	Figure 1

REFERENCE:
Site Plan, sheet 5, A0.0
dated 12-03-15, prepared by Golba Architecture



LEGEND

B-3 ⊕	Approximate location of BORING by TerraPacific Consultants, Inc.
P-4 ●	Approximate location of PERC. TEST by TerraPacific Consultants, Inc.

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4010 Morena Boulevard
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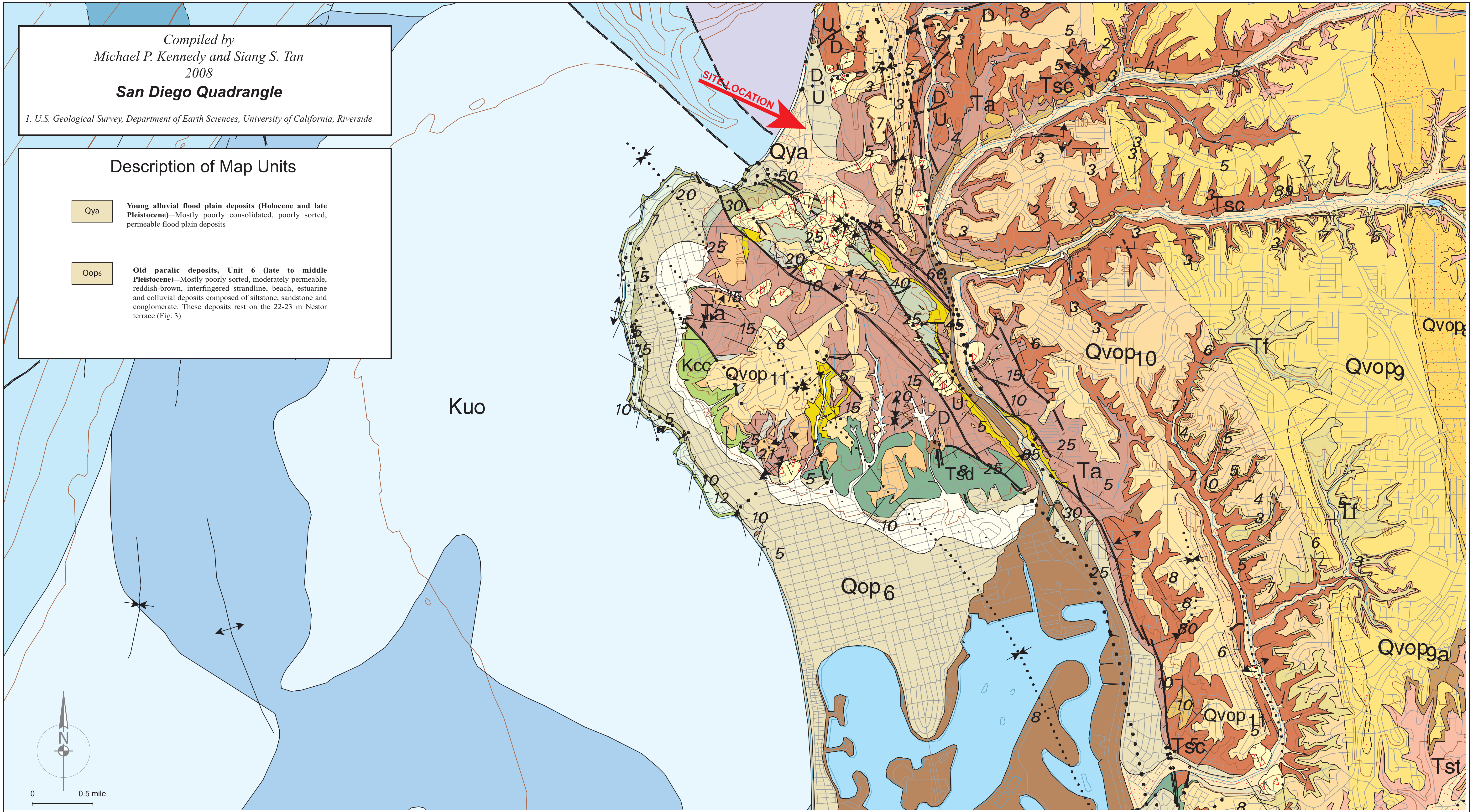
San Diego CA 92117
858-521-1190

Geotechnical Plan

Elkins Residence

File No. 16055
June 2016

Figure 2



Compiled by
Michael P. Kennedy and Siang S. Tan
2008
San Diego Quadrangle

1. U.S. Geological Survey, Department of Earth Sciences, University of California, Riverside

Description of Map Units

Qya	**Young alluvial flood plain deposits (Holocene and late Pleistocene)**—Mostly poorly consolidated, poorly sorted, permeable flood plain deposits
Qop6	**Old paralic deposits, Unit 6 (late to middle Pleistocene)**—Mostly poorly sorted, moderately permeable, reddish-brown, interfingered strandline, beach, estuarine and colluvial deposits composed of siltstone, sandstone and conglomerate. These deposits rest on the 22-23 m Nestor terrace (Fig. 3)

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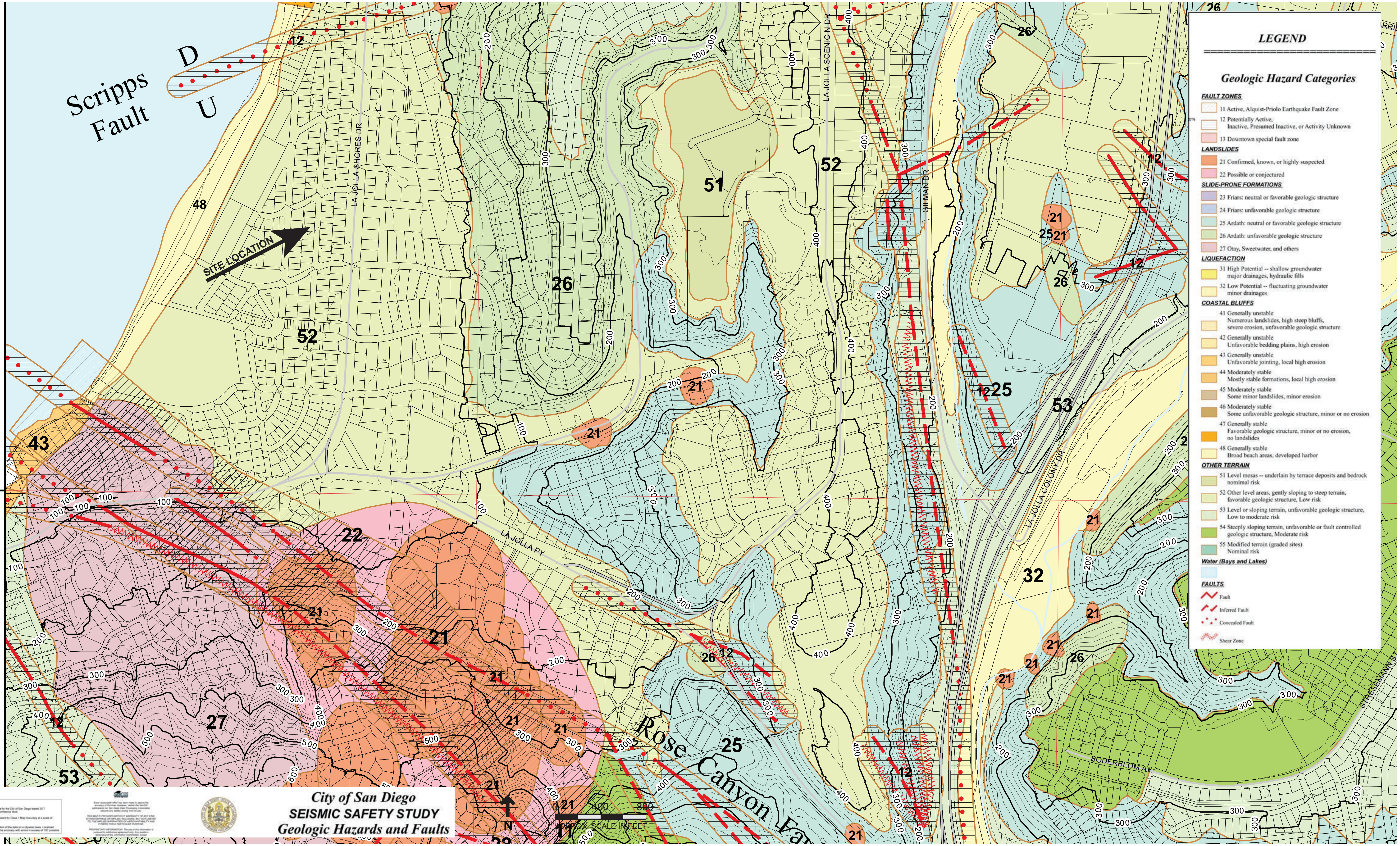
Geologic Map

Elkins Residence

File No. 16055
June 2016

Figure 3



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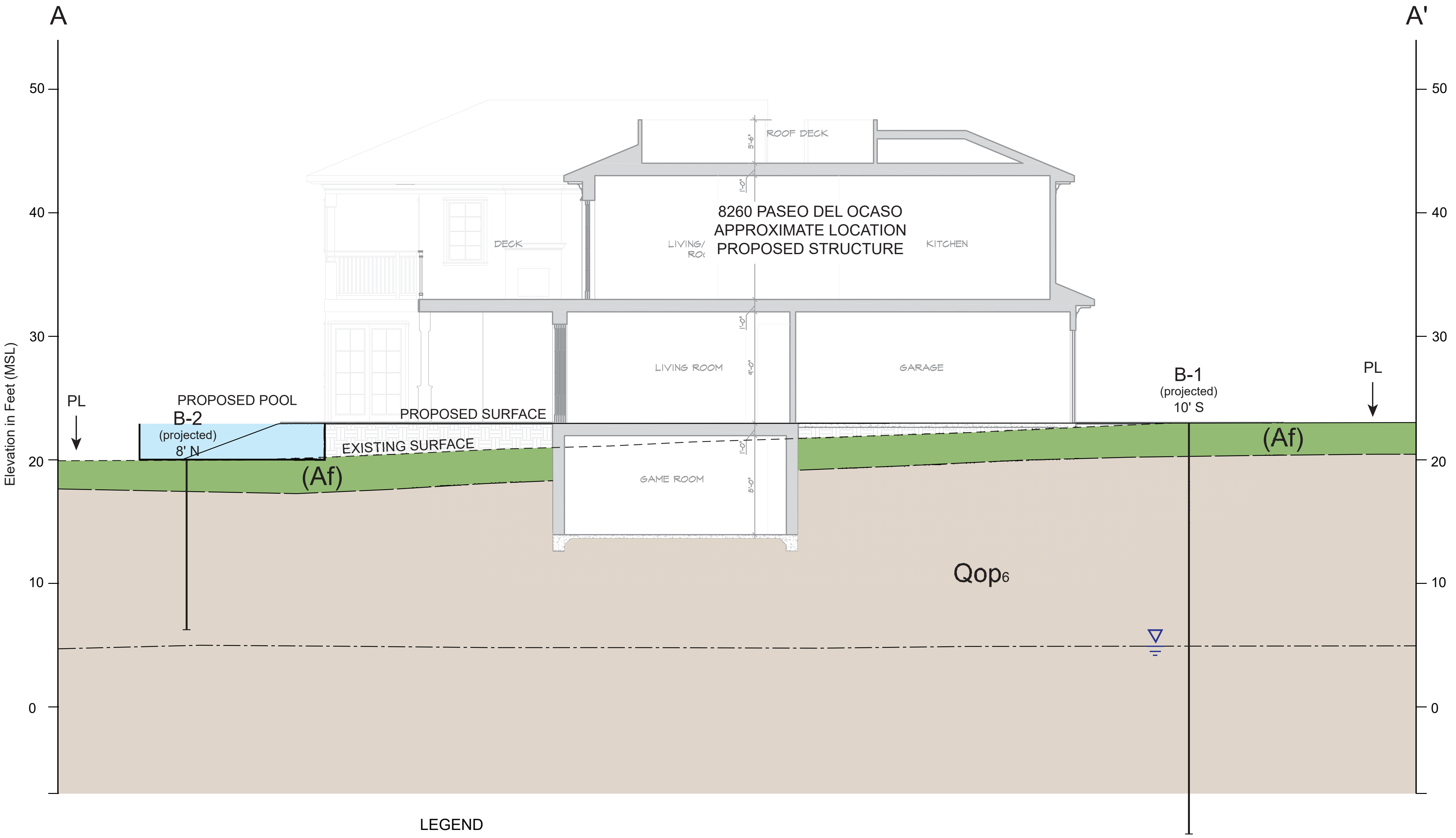
Seismic Safety Study Map

Elkins Residence

File No. 16055
June 2016

Figure 4

REFERENCE:
Building Sections, sheet 11, A3.0
dated 12-03-15, prepared by Golba Architecture



LEGEND

🟩 Af	Artificial fill - undocumented
Qop6	Quaternary-aged Old Paralic Deposits (unit 6)
-·-▽-·-	Approximate groundwater surface (based on B-1)

NOTE: Elevation 500' from plan set equals elevation 23' (MSL) on this section

0 5 10
APPROX. SCALE IN FEET

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858-521-1190

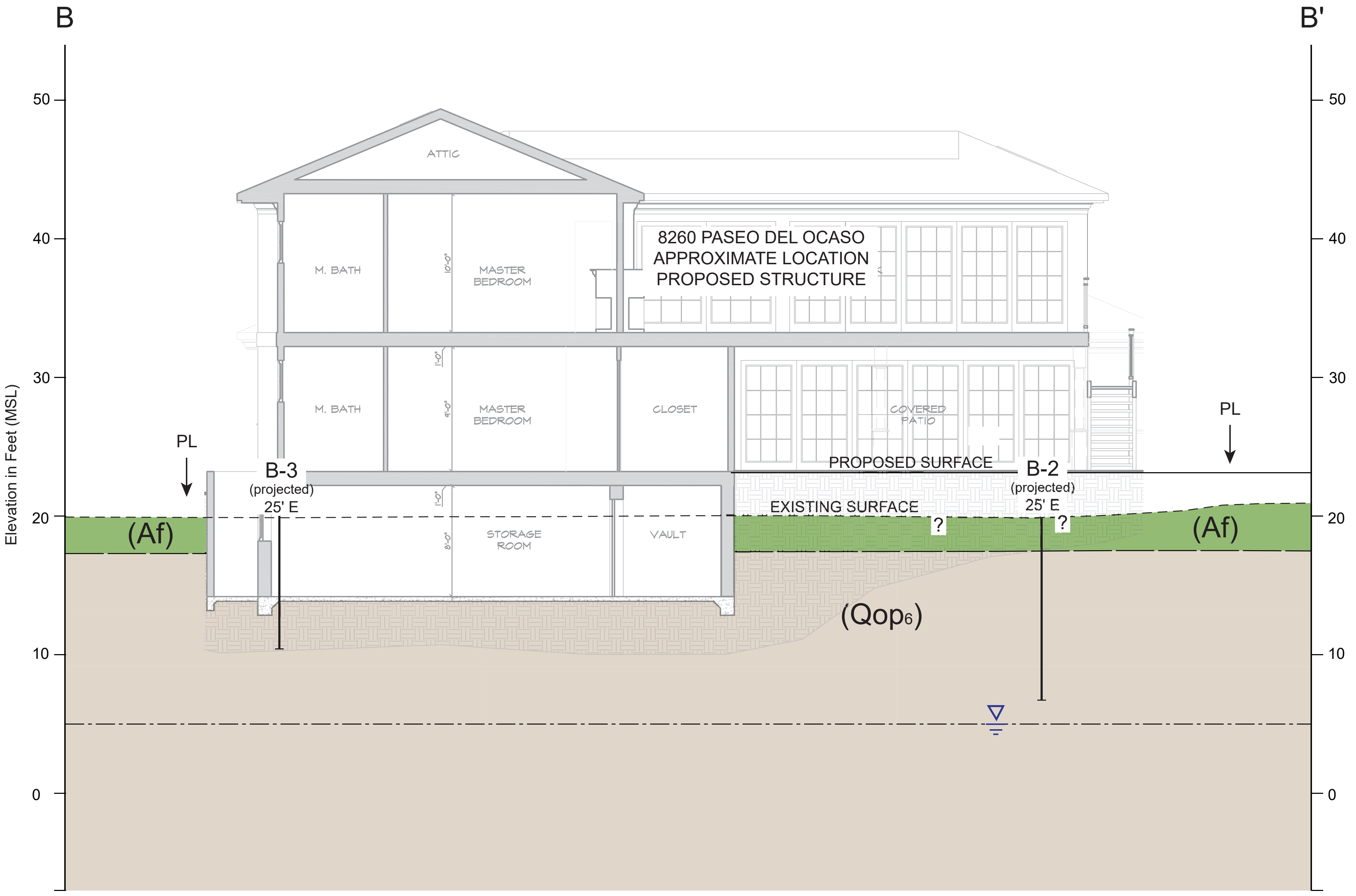
Cross Section A-A'

Elkins Residence

File No. 16055
June 2016

Figure 5

REFERENCE:
Building Sections, sheet 11, A3.0
dated 12-03-15, prepared by Golba Architecture



LEGEND

🟩 Af	Artificial fill - undocumented
▨ Qop6	Quaternary-aged Old Paralic Deposits (unit 6)
-·-▽-·-	Approximate groundwater surface (based on B-1)

NOTE: Elevation 500' from plan set equals elevation 23' (MSL) on this section

0 5 10
APPROX. SCALE IN FEET

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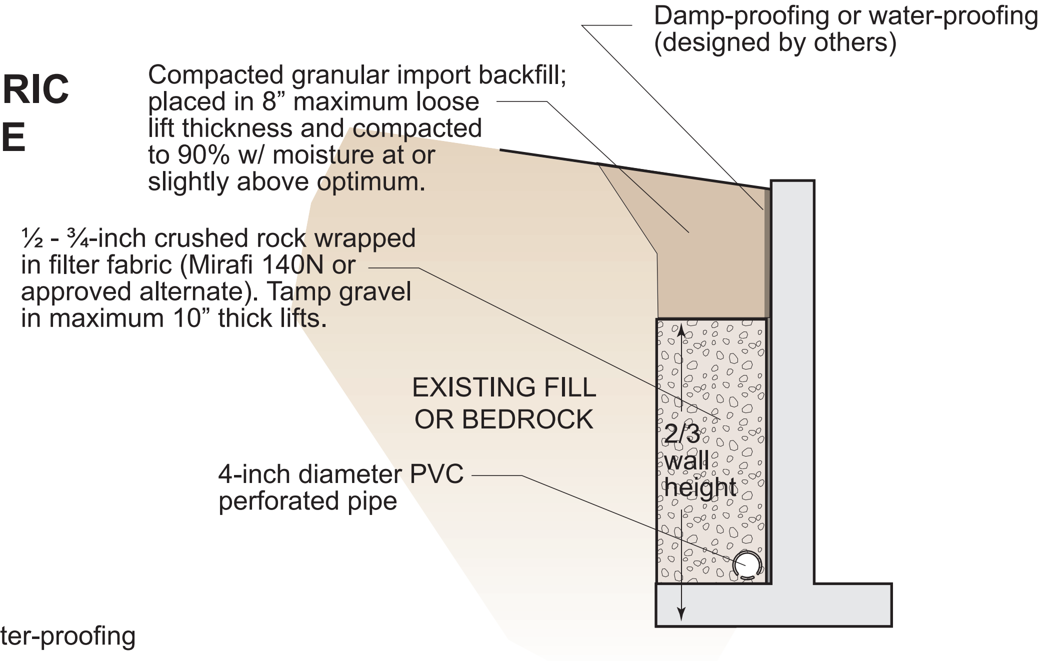
Cross Section B-B'

Elkins Residence

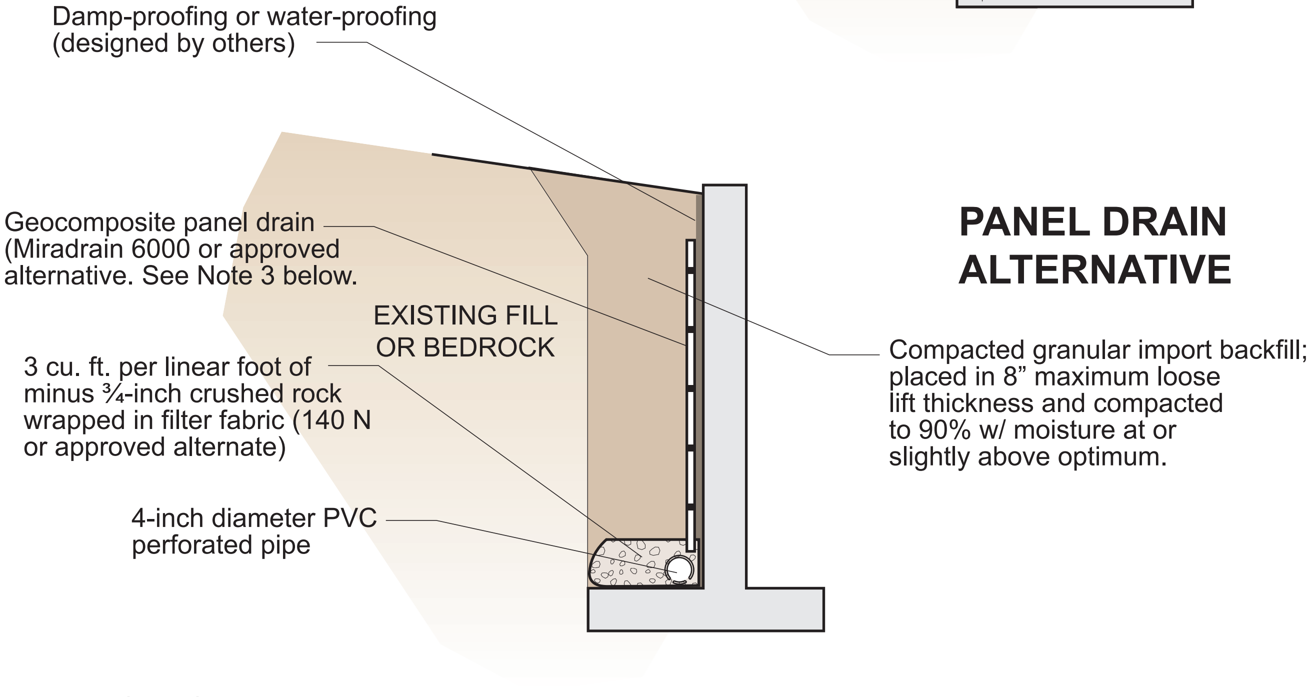
File No. 16055
June 2016

Figure 6

ROCK & FABRIC ALTERNATIVE



PANEL DRAIN ALTERNATIVE



NOTES:

1) Perforated pipe should outlet through to a solid pipe at maximum 25 foot centers to a free gravity outfall. Perforated pipe and outlet pipe should have a fall of at least 1%.

2) Filter fabric should consist of Mirafi 140N or similar approved fabric. Filter fabric should be overlapped at least 6-inches.

3) Geocomposite panel drain should consist of Miradrain 6000, Mirafi G100N, J-Drain 400, or approved similar product.

4) Drain installation should be observed by the geotechnical consultant prior to backfilling.

NOT TO SCALE

TerraPacific
CONSULTANTS INC

4010 Morena Bloulevard
Suite 108
San Diego CA 92117
858-521-1190

Retaining Wall
Drain Details

Elkins Residence

File No. 16055
June 2016

Figure 7

APPENDIX B

References

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APPENDIX C

Subsurface Excavation Logs

TerraPacific
CONSULTANTS INC

Subsurface Boring Log

Boring No: B-1

Project No: 16055
Project Name: Elkins Residence
Location: 8260 Paseo Del Ocaso
Sample Method: Modified California Sampler
Instrumentation: None installed
Elevation: Pad

Date: 5/6/16
Logged By: C. O'Hern
Drilling Company: Baja Drilling
Driller: Jose
Drill Rig Type: CME 55
Hammer Wt. & Drop: 140 lbs. for 30"

Depth (ft)	Lithology	DESCRIPTION & REMARKS	USCS	Sample Type	Blow Counts (6", 12", 18")	Dry Density (pcf)	Moisture (%)
0		FILL: From 0.0', Silty sand, medium gray brown to medium red brown, slightly moist, medium dense, medium grained	SM				
		NATIVE (Old Paralic Deposits, Unit 6): From 2.7', Silty sandstone, medium gray brown to medium red brown, slightly moist, dense, medium grained, clean sandstone, increased density with depth, gradational changes with medium to coarse grained sand, friable, poorly cemented		Ring / Bulk	8/17/18	126.3	3.4
5				Ring	9/19/29	123.1	6.2
10				Ring	14/16/44	117.8	4.0
		From 12.1', Silty sandstone, pale to medium gray brown, slightly moist to moist, dense, medium to coarse grained, friable, poorly cemented					
15				Ring	17/33/37	109.4	2.8
20				Ring	17/27/50 for 2"	119.1	15.5
25				Ring	20/28/50 for 2"	121.1	13.8
30				Ring	30/44/50 for 2"	121.7	13.1
35		NOTE: Temporary construction standpipe installed to 28.0' on May 6 4:00 pm water at 18.1'					
40							

Total Depth: 33.0'
Water: No
Caving: No
Hole Diameter: 6"

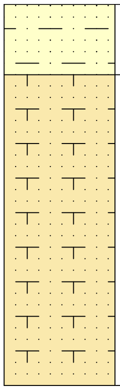
Boring
B-1

Subsurface Boring Log

Boring No: B-2

Project No: 16055
Project Name: Elkins Residence
Location: 8260 Paseo Del Ocaso
Sample Method: Modified California Sampler
Instrumentation: None installed
Elevation: FS

Date: 5/6/16
Logged By: O. Brambila
Drilling Company: Native
Driller: Gabriel
Drill Rig Type: Tri-Pod
Hammer Wt. & Drop: 140 lbs. for 30"



Depth (ft)	Lithology	DESCRIPTION & REMARKS	USCS	Sample Type	Blow Counts (6", 12", 18")	Dry Density (pcf)	Moisture (%)
0		FILL: From 0.0', Silty sand, medium brown to yellow brown, slightly moist to moist, loose to medium dense, few roots in upper 2', fine to medium grained	SM	Bulk	--	--	--
		NATIVE (Old Paralic Deposits, Unit 6): From 2.5', Silty sandstone, yellow brown, slightly moist, dense, some oxidation stains		Ring	13/17/30	103.4	4.5
		@ 8.0', Turns to light yellow brown		Ring	30/30/20 for 3"	112.7	5.8
				Ring	20/35/25 for 2"	106.9	3.2

Total Depth: 13.5'
Water: No
Caving: No
Hole Diameter: 6"

Boring

B-2

TerraPacific
CONSULTANTS INC

Subsurface Boring Log

Boring No: B-3

Project No: 16055
Project Name: Elkins Residence
Location: 8260 Paseo Del Ocaso
Sample Method: Modified California Sampler
Instrumentation: None installed
Elevation: FS

Date: 5/6/16
Logged By: O. Brambila
Drilling Company: Native
Driller: Gabriel
Drill Rig Type: Tri-Pod
Hammer Wt. & Drop: 140 lbs. for 30"

Depth (ft)	Lithology	DESCRIPTION & REMARKS	USCS	Sample Type	Blow Counts (6", 12", 18")	Dry Density (pcf)	Moisture (%)
0	▨	FILL: From 0.0', Silty sand, medium brown to reddish brown, slightly moist to moist, loose to medium dense	SM				
	▨	NATIVE (Old Paralic Deposits, Unit 6): From 2.5', Sandstone, light yellow brown, slightly moist, dense, fine to medium grained, friable, rust staining		Ring Ring	8/15/17 22/33/20	104.0 107.7	3.4 4.7
5							
10							
15							
20							
25							
30							
35							
40							

Total Depth: 9.5'
Water: No
Caving: No
Hole Diameter: 6"

Boring
B-3
Page 1 of 1

APPENDIX D

Laboratory Test Results

Elkins Residence

Summary of Laboratory Test Results

FN 16055

Sample Location			Corrosivity Series		ASTM D 1557		ASTM D 2937		ASTM D 3080		ASTM D 4829		ASTM D 4546	
			CTM422	CTM 417										
Location	Sample Depth (ft)	Sample Type	Chloride Content (%)	Sulfate Content (%)	Maximum Dry Density (pcf)	Opt. Moist Content (%)	Dry Density (pcf)	Moisture Content (%)	Peak φ (degrees)	Peak c (psf)	Expansion Index	Expansion Potential	Hydro Response (%)	Normal Stress (psf)
B-1	0'-10'	L.Bulk	--	--	121.0	10.5	--	--	39.0	150.0	--	--	--	--
B-1	3'	Ring	--	--	--	--	126.3	3.4	--	--	--	--	--	--
B-1	5'	Ring	--	--	--	--	123.1	6.2	--	--	--	--	--	--
B-1	10'	Ring	--	--	--	--	117.8	4.0	--	--	--	--	-0.30	500
B-1	15'	Ring	--	--	--	--	109.4	2.8	--	--	--	--	--	--
B-1	20'	Ring	--	--	--	--	119.1	15.5	--	--	--	--	--	--
B-1	25'	Ring	--	--	--	--	121.1	13.8	--	--	--	--	--	--
B-1	30'	Ring	--	--	--	--	121.7	13.1	--	--	--	--	--	--
B-2	0'-8'	L.Bulk	--	--	--	--	--	--	--	--	--	--	--	--
B-2	4'	Ring	--	--	--	--	103.4	4.5	--	--	--	--	--	--
B-2	8'	Ring	--	--	--	--	112.7	5.8	--	--	--	--	--	--
B-2	12'	Ring	--	--	--	--	106.9	3.2	--	--	--	--	--	--
B-3	0'-4'	L.Bulk	0.002	0.011	--	--	--	--	--	--	0	Very Low	--	--
B-3	4'	Ring	--	--	--	--	104.0	3.4	--	--	--	--	--	--
B-3	8'	Ring	--	--	--	--	107.7	4.7	--	--	--	--	--	--

COMPACTION TEST

ASTM D 1557

Modified Proctor

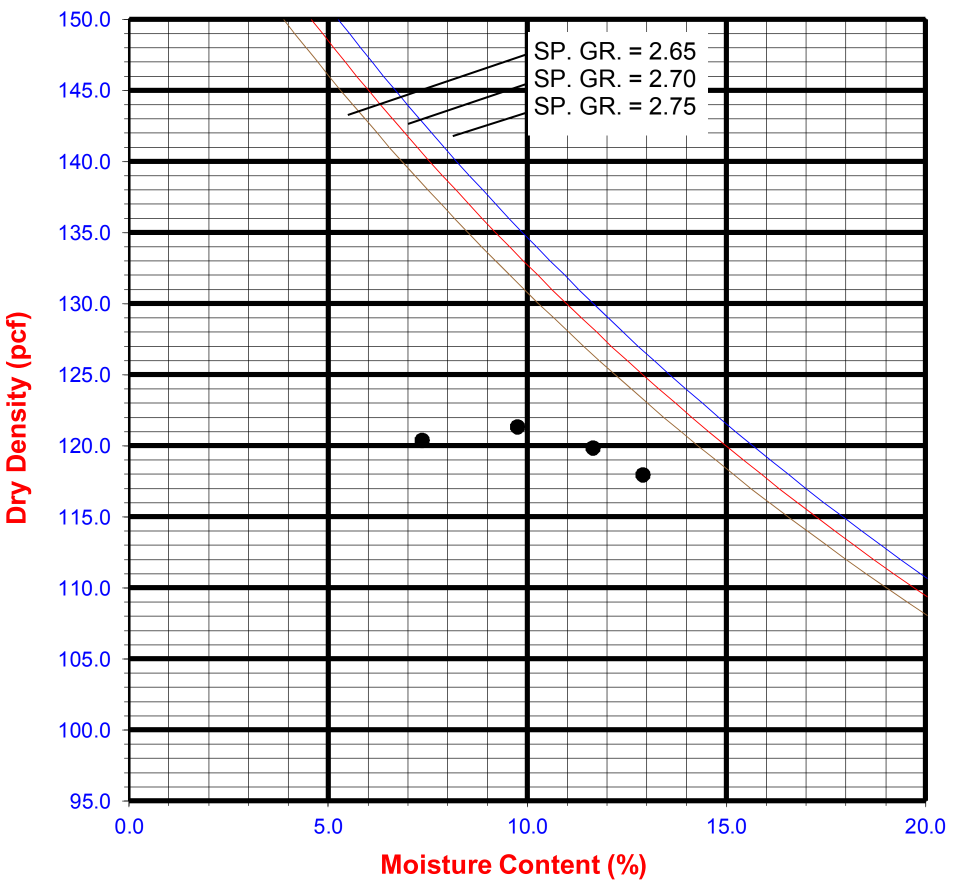
Project Name: Elkins Residence
Project No. : 16055
Boring No.: B-3 @ 0'-10'
Technician: CR
Date: 5/26/2016
Visual Sample Description:
Tan silty sand

☒ **Manual Ram**

Ram Weight 10 LBS Drop 18 inches

		TEST NO.	1	2	3	4	5	6
A	Wt. Comp. Soil + Mold (gm.)		3850.00	3790.00	3860.00	3850.00		
B	Wt. of Mold (gm.)		1820.00	1820.00	1820.00	1820.00		
C	Net Wt. of Soil (gm.)	A - B	2030.00	1970.00	2040.00	2030.00		
D	Wet Wt. of Soil + Cont. (gm.)		1644.1	1690.5	1596.9	1349.9		
E	Dry Wt. of Soil + Cont. (gm.)		1515.3	1587.9	1450.9	1217.4		
F	Wt. of Container (gm.)		193.3	192.3	198.0	189.9		
G	Moisture Content (%)	[(D-F)-(E-F)]/(E-F)	9.7	7.4	11.7	12.9		
H	Wet Density (pcf)	C*29.76 /453.6	133.2	129.2	133.8	133.2		
I	Dry Density (pcf)	H/(1+G/100)	121.4	120.4	119.9	118.0		

Maximum Dry Density (pcf) ☐ **Optimum Moisture Content (%)** ☐



PROCEDURE USED

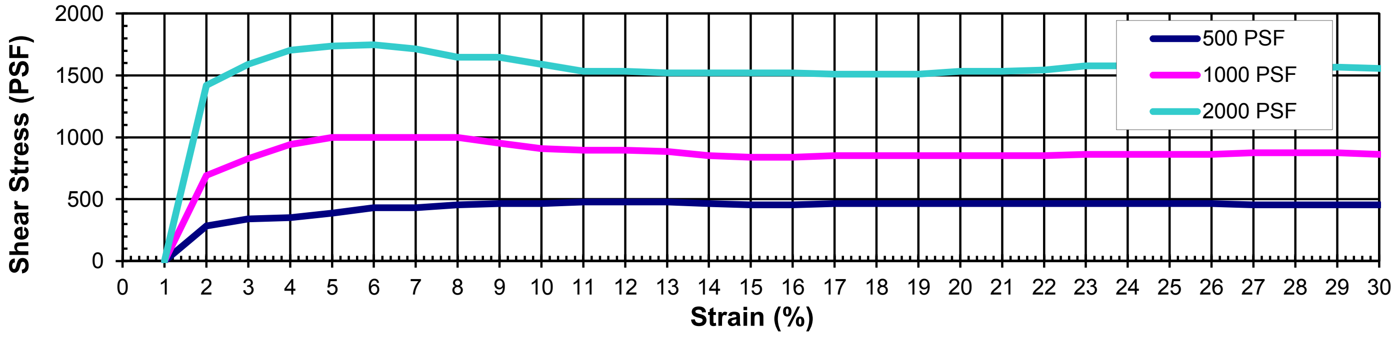
Procedure A

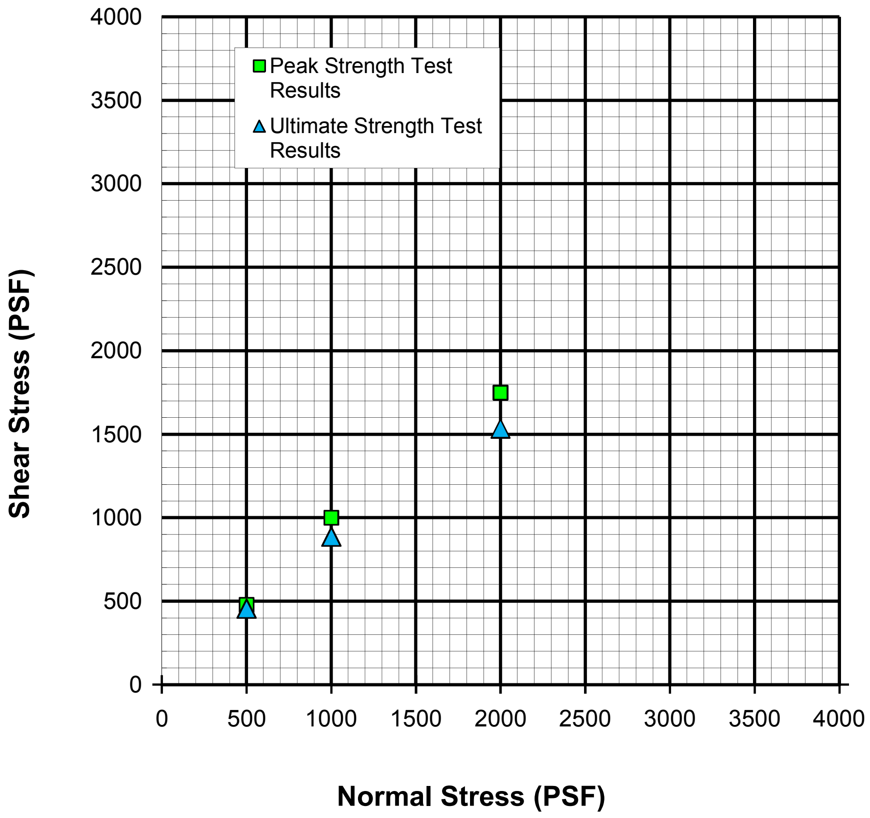
Soil Passing No. 4 (4.75 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
May be used if No.4 retained < 20%

DIRECT SHEAR TEST

Laboratory Report

File Name:	Elkins Residence
File No.:	16055
Date:	5/27/2016
Technician:	CR





Sample No.& Location:	B-3 @ 0'-10'
Soil Description:	Tan silty sand
Sample Type:	Remolded
Specimen Preparation:	Inundated

	Peak	Ultimate
Friction Angle Φ' (deg)		
Cohesion C' (psf)		

	In-Situ	As-Tested
Dry Density (pcf)	109.0	109.0
Moisture Content (%)	10.5	18.1

Strain Rate (in/min)

APPENDIX E

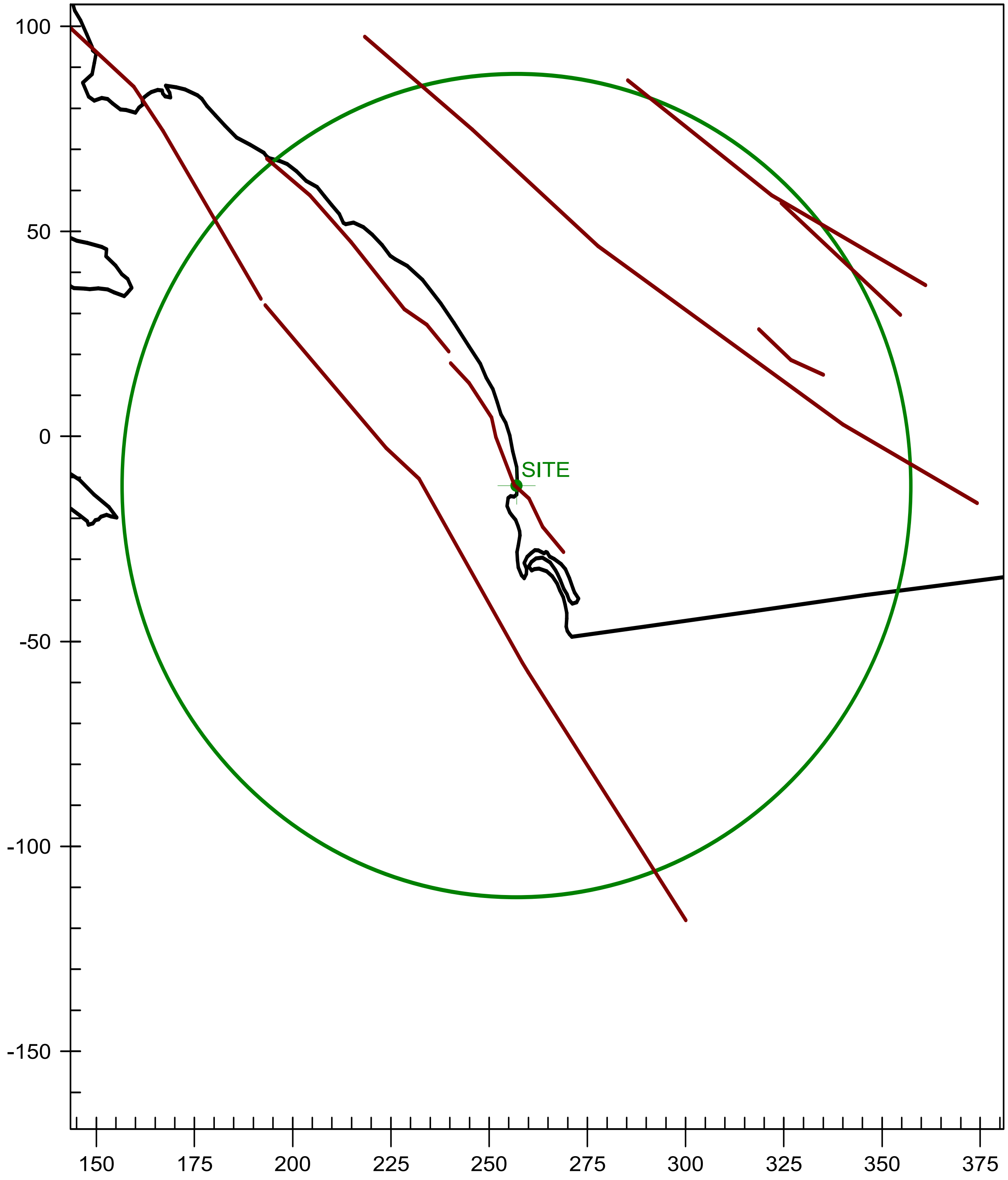
Summary of Active Faults

```
                         ***********************
                         *                     *
                         *    E Q F A U L T    *
                         *                     *
                         *    Version 3.00     *
                         *                     *
                         ***********************

                      DETERMINISTIC ESTIMATION OF
                PEAK ACCELERATION FROM DIGITIZED FAULTS


JOB NUMBER: 16055
                                                      DATE: 06-16-2016

JOB NAME: 8260 Paseo Del Ocaso

CALCULATION NAME: 8260 Paseo Del Ocaso

FAULT-DATA-FILE NAME: C:\Program Files\EQFAULT1\CDMGFLTE_new.dat


SITE COORDINATES:
   SITE LATITUDE:  32.8564
   SITE LONGITUDE:  117.2549

SEARCH RADIUS:   62.4  mi

ATTENUATION RELATION:  14) Campbell & Bozorgnia (1997 Rev.) - Alluvium
   UNCERTAINTY (M=Median, S=Sigma): M       Number of Sigmas:  0.0
   DISTANCE MEASURE:  cdist
   SCOND:   0
   Basement Depth:  5.00 km     Campbell SSR:  0     Campbell SHR:  0
   COMPUTE PEAK HORIZONTAL ACCELERATION

FAULT-DATA FILE USED:  C:\Program Files\EQFAULT1\CDMGFLTE_new.dat


MINIMUM DEPTH VALUE (km):  3.0
```

```
                                 ---------------
                                 EQFAULT SUMMARY
                                 ---------------



                          -----------------------------
                          DETERMINISTIC SITE PARAMETERS
                          -----------------------------

Page  1
-------------------------------------------------------------------------------
                                |              |ESTIMATED MAX. EARTHQUAKE EVENT
                                | APPROXIMATE  |-------------------------------
          ABBREVIATED           |  DISTANCE    | MAXIMUM  |   PEAK   |EST. SITE
          FAULT  NAME           |  mi   (km)   |EARTHQUAKE|   SITE   |INTENSITY
                                |              | MAG.(Mw) | ACCEL. g |MOD.MERC.
================================|==============|==========|==========|=========
ROSE CANYON                     |   0.5(   0.8)|   7.2    |   0.515  |    X
CORONADO BANK                   |  12.9(  20.8)|   7.6    |   0.327  |   IX
NEWPORT-INGLEWOOD (Offshore)    |  23.1(  37.2)|   7.1    |   0.136  |  VIII
ELSINORE-JULIAN                 |  37.2(  59.9)|   7.1    |   0.077  |   VII
ELSINORE-TEMECULA               |  38.6(  62.2)|   6.8    |   0.056  |   VI
EARTHQUAKE VALLEY               |  45.1(  72.6)|   6.5    |   0.035  |    V
PALOS VERDES                    |  49.5(  79.6)|   7.1    |   0.053  |   VI
ELSINORE-COYOTE MOUNTAIN        |  52.4(  84.3)|   6.8    |   0.038  |    V
ELSINORE-GLEN IVY               |  54.6(  87.9)|   6.8    |   0.036  |    V
SAN JACINTO-ANZA                |  59.7(  96.0)|   7.2    |   0.046  |   VI
SAN JACINTO-COYOTE CREEK        |  60.0(  96.6)|   6.8    |   0.032  |    V
*******************************************************************************
-END OF SEARCH-   11 FAULTS FOUND WITHIN THE SPECIFIED SEARCH RADIUS.

THE ROSE CANYON                      FAULT IS CLOSEST TO THE SITE.
IT IS ABOUT 0.5 MILES (0.8 km) AWAY.

LARGEST MAXIMUM-EARTHQUAKE SITE ACCELERATION: 0.5154 g
```

CALIFORNIA FAULT MAP

8260 Paseo Del Ocaso



APPENDIX F

Storm Water Standards

Worksheet C.4-1: Categorization of Infiltration Feasibility Condition

<table>
<tr><th colspan="2">Categorization of Infiltration Feasibility Condition</th><th colspan="2">Worksheet C.4 1</th></tr>
<tr><td colspan="4">Part 1 - Full Infiltration Feasibility Screening Criteria
Would infiltration of the full design volume be feasible from a physical perspective without any undesirable consequences that cannot be reasonably mitigated?</td></tr>
<tr><td>Criteria</td><td>Screening Question</td><td>Yes</td><td>No</td></tr>
<tr><td>1</td><td>Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.</td><td>X</td><td></td></tr>
<tr><td colspan="4">Provide basis:
Site-specific percolation testing was conducted in conformance with the County of San Diego Standards. Based on this testing, percolation rates ranging from >36 inches to 20.25 inches per hour with corresponding infiltration rates of 4.1 inches to 7.2 inches per hour were measured. The test locations are provided on Figure 2 in Appendix A of this report. Additional discussion is provided within Section 6.10 of this report. The project Civil Engineer should ultimately evaluate the feasibility of using infiltration on-site and any necessary factor of safety to be applied to the measured percolation rate/infiltration rate used in design of such a system.
Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</td></tr>
<tr><td>2</td><td>Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.</td><td>X</td><td></td></tr>
<tr><td colspan="4">Provide basis:
The site configuration is considered favorable for infiltration due to lack of slopes and shallow groundwater (i.e. greater than 10 feet deep); however, as is always the case, the addition of on-site infiltration systems may have a negative impact to surrounding proposed or existing structures or improvements due to the increased soil saturation levels. Laboratory testing from samples obtained during our investigation including expansion index (ASTM D-4829) and hydro-response (ASTM D-4546), indicated the near surface soils possess a low expansion potential and negligible collapse potential. Based on the site configuration and subsurface soil profile, infiltration would likely not significantly increase risk of geotechnical hazards; however, some level of increased risk cannot be completely ruled out. Proposed infiltration areas should be located away from planned or existing improvements as to minimize potential risk.
Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</td></tr>
</table>

<table>
<tr><th colspan="4">Worksheet C.4 1 Page 2 of 4</th></tr>
<tr><td>Criteria</td><td>Screening Question</td><td>Yes</td><td>No</td></tr>
<tr><td>3</td><td>Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, storm water pollutants or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.</td><td>X</td><td></td></tr>
<tr><td colspan="4">Provide basis:
Our site-specific subsurface exploration and subsequent monitoring encountered groundwater at an approximate depth of 18 feet below ground surface. The planned residential use will limit contamination potential; however, the increased risk for groundwater contamination from infiltration cannot be completely ruled out, as such, a bio-swale system, which incorporates appropriate filtering mechanisms, should be designed.
Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</td></tr>
<tr><td>4</td><td>Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.</td><td>x</td><td></td></tr>
<tr><td colspan="4">Provide basis:
The subject residential site is located approximately 750 feet east of the Pacific Ocean and is within a residential neighborhood. A review of aerial images does not indicate the presence of bodies of freshwater or areas of water harvesting down gradient from the site. It is not likely that downstream water rights are present.
Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</td></tr>
<tr><td>Part 1 Result*</td><td colspan="2">If all answers to rows 1 - 4 are “Yes” a full infiltration design is potentially feasible. The feasibility screening category is Full Infiltration
If any answer from row 1-4 is “No”, infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a “full infiltration” design. Proceed to Part 2</td><td>X</td></tr>
</table>

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by City Engineer to substantiate findings.

APPENDIX G

Standard Grading Guidelines

STANDARD GUIDELINES FOR GRADING PROJECTS

TABLE OF CONTENTS

GENERAL

The guidelines contained herein and the standard details attached hereto represent this firm's standard recommendations for grading and other associated operations on construction projects. These guidelines should be considered a portion of the project specifications.

All plates attached hereto shall be considered as part of these guidelines.

The Contractor should not vary from these guidelines without prior recommendation by the Geotechnical Consultant and the approval of the Client or his authorized representative. Recommendation by the Geotechnical Consultant and/or Client should not be considered to preclude requirements for approval by the controlling agency prior to the execution of any changes.

These Standard Grading Guidelines and Standard Details may be modified and/or superseded by recommendations contained in the text of the preliminary geotechnical report and/or subsequent reports.

If disputes arise out of the interpretation of these grading guidelines or standard details, the Geotechnical Consultant shall provide the governing interpretation.

DEFINITIONS OF TERMS

ALLUVIUM - Unconsolidated soil deposits resulting from flow of water, including sediments deposited in river beds, canyons, flood plains, lakes, fans and estuaries.

AS-GRADED (AS-BUILT) - The surface and subsurface conditions at completion of grading.

BACKCUT - A temporary construction slope at the rear of earth retaining structures such as buttresses, shear keys, stabilization fills or retaining walls.

BACKDRAIN - Generally a pipe and gravel or similar drainage system placed behind earth retaining structures such buttresses, stabilization fills, and retaining walls.

BEDROCK - Relatively undisturbed formational rock, more or less solid, either at the surface or beneath superficial deposits of soil.

BENCH - A relatively level step and near vertical rise excavated into sloping ground on which fill is to be placed.

BORROW (Import) - Any fill material hauled to the project site from off-site areas.

BUTTRESS FILL - A fill mass, the configuration of which is designed by engineering calculations to retain slope conditions containing adverse geologic features. A buttress is generally specified by minimum key width and depth and by maximum backcut angle. A buttress normally contains a back-drainage system.

CIVIL ENGINEER - The Registered Civil Engineer or consulting firm responsible for preparation of the grading plans, surveying and verifying as-graded topographic conditions.

CLIENT - The Developer or his authorized representative who is chiefly in charge of the project. He shall have the responsibility of reviewing the findings and recommendations made by the Geotechnical Consultant and shall authorize the Contractor and/or other consultants to perform work and/or provide services.

COLLUVIUM - Generally loose deposits usually found near the base of slopes and brought there chiefly by gravity through slow continuous downhill creep (also see Slope Wash).

COMPACTION - Densification of man-placed fill by mechanical means.

CONTRACTOR - A person or company under contract or otherwise retained by the Client to perform demolition, grading and other site improvements.

DEBRIS - All products of clearing, grubbing, demolition, contaminated soil materials unsuitable for reuse as compacted fill and/or any other material so designated by the Geotechnical Consultant.

ENGINEERING GEOLOGIST - A Geologist holding a valid certificate of registration in the specialty of Engineering Geology.

ENGINEERED FILL - A fill of which the Geotechnical Consultant or his representative, during grading, has made sufficient tests to enable him to conclude that the fill has been placed in substantial compliance with the recommendations of the Geotechnical Consultant and the governing agency requirements.

EROSION - The wearing away of the ground surface as a result of the movement of wind and/or water.

EXCAVATION - The mechanical removal of earth materials.

EXISTING GRADE - The ground surface configuration prior to grading.

FILL - Any deposits of soil, rock, soil-rock blends or other similar materials placed by man.

FINISH GRADE - The ground surface configuration at which time the surface elevations conform to the approved plan.

GEOFABRIC - Any engineering textile utilized in geotechnical applications including subgrade stabilization and filtering.

GEOLOGIST - A representative of the Geotechnical Consultant educated and trained in the field of geology.

GEOTECHNICAL CONSULTANT - The Geotechnical Engineering and Engineering Geology consulting firm retained to provide technical services for the project. For the purpose of these specifications, observations by the Geotechnical Consultant include observations by the Soil Engineer, Geotechnical Engineer, Engineering Geologist and those performed by persons employed by and responsible to the Geotechnical Consultants.

GEOTECHNICAL ENGINEER - A licensed Geotechnical Engineer or Civil Engineer who applies scientific methods, engineering principles and professional experience to the acquisition, interpretation and use of knowledge of materials of the earth's crust for the evaluation of engineering problems. Geotechnical Engineering encompasses many of the engineering aspects of soil mechanics, rock mechanics, geology, geophysics, hydrology and related sciences.

GRADING - Any operation consisting of excavation, filling or combinations thereof and associated operations.

LANDSLIDE DEBRIS - Material, generally porous and of low density, produced from instability of natural or man-made slopes.

MAXIMUM DENSITY - Standard laboratory test for maximum dry unit weight. Unless otherwise specified, the maximum dry unit weight shall be determined in accordance with ASTM Method of Test D 1557-09.

OPTIMUM MOISTURE - Soil moisture content at the test maximum density.

RELATIVE COMPACTION - The degree of compaction (expressed as a percentage) of dry unit weight of a material as compared to the maximum dry unit weight of the material.

ROUGH GRADE - The ground surface configuration at which time the surface elevations approximately conform to the approved plan.

SITE - The particular parcel of land where grading is being performed.

SHEAR KEY - Similar to buttress, however, it is generally constructed by excavating a slot within a natural slope in order to stabilize the upper portion of the slope without grading encroaching into the lower portion of the slope.

SLOPE - An inclined ground surface the steepness of which is generally specified as a ratio of horizontal:vertical (e.g., 2:1).

SLOPE WASH - Soil and/or rock material that has been transported down a slope by action of gravity assisted by runoff water not confined by channels (also see Colluvium).

SOIL - Naturally occurring deposits of sand, silt, clay, etc., or combinations thereof.

SOIL ENGINEER - Licensed Geotechnical Engineer or Civil Engineer experienced in soil mechanics (also see Geotechnical Engineer).

STABILIZATION FILL - A fill mass, the configuration of which is typically related to slope height and is specified by the standards of practice for enhancing the stability of locally adverse conditions. A stabilization fill is normally specified by minimum key width and depth and by maximum backcut angle. A stabilization fill may or may not have a back drainage system specified.

SUBDRAIN - Generally a pipe and gravel or similar drainage system placed beneath a fill in the alignment of canyons or former drainage channels.

SLOUGH - Loose, non-compacted fill material generated during grading operations.

TAILINGS – Non-engineered fill which accumulates on or adjacent to equipment haul-roads.

TERRACE - Relatively level step constructed in the face of graded slope surface for drainage control and maintenance purposes.

TOPSOIL - The presumable fertile upper zone of soil which is usually darker in color and loose.

WINDROW - A string of large rocks buried within engineered fill in accordance with guidelines set forth by the Geotechnical Consultant.

OBLIGATIONS OF PARTIES

The Geotechnical Consultant should provide observation and testing services and should make evaluations in order to advise the Client on geotechnical matters. The Geotechnical Consultant should report his findings and recommendations to the Client or his authorized representative.

The client should be chiefly responsible for all aspects of the project. He or his authorized representative has the responsibility of reviewing the findings and recommendations of the Geotechnical Consultant. He shall authorize or cause to have authorized the Contractor and/or other consultants to perform work and/or provide services. During grading the Client or his authorized representative should remain on-site or should remain reasonably accessible to all concerned parties in order to make decisions necessary to maintain the flow of the project.

The Contractor should be responsible for the safety of the project and satisfactory completion of all grading and other associated operations on construction projects, including but not limited to, earthwork in accordance with the project plans, specifications and controlling agency requirements. During grading, the Contractor or his authorized representative should remain on-site. Overnight and on days off, the Contractor should remain accessible.

SITE PREPARATION

The Client, prior to any site preparation or grading, should arrange and attend a meeting among the Grading Contractor, the Design Engineer, the Geotechnical Consultant, representatives of the appropriate governing authorities as well an any other concerned parties. All parties should be given at least 48 hours notice.

Clearing and grubbing should consist of the removal of vegetation such as brush, grass, woods, stumps, trees, roots of trees and otherwise deleterious natural materials from the areas to be graded. Clearing and grubbing should extend to the outside of all proposed excavation and fill areas.

Demolition should include removal of buildings, structures, foundations, reservoirs, utilities (including underground pipelines, septic tanks, leach fields, seepage pits, cisterns, mining shafts, tunnels, etc.) and other man-made surface and subsurface improvements from the areas to be graded. Demolition of utilities should include proper capping and/or re-routing pipelines at the project perimeter and cutoff and capping of wells in accordance with the requirements of the governing authorities and the recommendations of the Geotechnical Consultant at the time of demolition.

Trees, plants or man-made improvements not planned to be removed or demolished should be protected by the Contractor from damage or injury.

Debris generated during clearing, grubbing and/or demolition operations should be wasted from areas to be graded and disposed off-site. Clearing, grubbing and demolition operations should be performed under the observation of the Geotechnical Consultant.

The Client or Contractor should obtain the required approvals from the controlling authorities for the project prior, during and/or after demolition, site preparation and removals, etc. The appropriate approvals should be obtained prior to proceeding with grading operations.

SITE PROTECTION

Protection of the site during the period of grading should be the responsibility of the Contractor. Unless other provisions are made in writing and agreed upon among the concerned parties, completion of a portion of the project should not be considered to preclude that portion or adjacent areas from the requirements for site protection until such time as the entire project is complete as identified by the Geotechnical Consultant, the Client and the regulating agencies.

The Contractor should be responsible for the stability of all temporary excavations. Recommendations by the Geotechnical Consultant pertaining to temporary excavations (e.g., backcuts) are made in consideration of stability of the completed project and, therefore, should not be considered to preclude the responsibilities of the Contractor. Recommendations by the Geotechnical Consultant should not be considered to preclude more restrictive requirements by the regulating agencies.

Precautions should be taken during the performance of site clearing, excavations and grading to protect the work site from flooding, ponding, or inundation by poor or improper surface drainage. Temporary provisions should be made during the rainy season to adequately direct surface drainage away from and off the work site. Where low areas can not be avoided, pumps should be kept on hand to continually remove water during periods of rainfall.

During periods of rainfall, plastic sheeting should be kept reasonably accessible to prevent unprotected slopes from becoming saturated. Where necessary during periods of rainfall, the Contractor should install check dams, desilting basins, riprap, sand bags or other devices or methods necessary to control erosion and provide safe conditions.

During periods of rainfall, the Geotechnical Consultant should be kept informed by the Contractor as to the nature of remedial or preventative work being performed (e.g., pumping, placement of sandbags or plastic sheeting, other labor, dozing, etc.).

Following periods of rainfall, the Contractor should contact the Geotechnical Consultant and arrange a walk-over of the site in order to visually assess rain related damage. The Geotechnical Consultant may also recommend excavations and testing in order to aid in his assessments. At the request of the Geotechnical Consultant, the Contractor shall make excavations in order to evaluate the extent of rain related damage.

Rain related damage should be considered to include, but may not be limited to, erosion, silting, saturation, swelling, structural distress and other adverse conditions identified by the Geotechnical Consultant. Soil adversely affected should be classified as Unsuitable Materials and should be subject to over-excavation and replacement with compacted fill or other remedial grading as recommended by the Geotechnical Consultant.

Relatively level areas, where saturated soils and/or erosion gullies exist to depths of greater than 1-foot, should be over-excavated to unaffected, competent material. Where less than 1-foot in depth, unsuitable materials may be processed in-place to achieve near optimum moisture conditions, then thoroughly recompacted in accordance with the applicable specifications. If the desired results are not achieved, the affected materials should be over-excavated, then replaced in accordance with the applicable specifications.

In slope areas, where saturated soil and/or erosion gullies exist to depths of greater than 1 foot, they should be over-excavated and replaced as compacted fill in accordance with the applicable specifications. Where affected materials exist to depths of 1 foot or less below proposed finished grade, remedial grading by moisture conditioning in-place, followed by thorough recompaction in accordance with the applicable grading guidelines herein may be attempted. If the desired results are not achieved, all affected materials should be over-excavated and replaced as compacted fill in accordance with the slope repair recommendations herein. As field conditions dictate, other slope repair procedures may be recommended by the Geotechnical Consultant.

EXCAVATIONS

Unsuitable Materials

Materials which are unsuitable should be excavated under observation and recommendations of the Geotechnical Consultant. Unsuitable materials include, but may not be limited to, dry, loose, soft, wet, organic compressible natural soils and fractured, weathered, soft bedrock and non-engineered or otherwise deleterious fill materials.

Material identified by the Geotechnical Consultant as unsatisfactory due to its moisture conditions should be over-excavated, watered or dried, as needed, and thoroughly blended to a uniform near optimum moisture condition (per Moisture guidelines presented herein) prior to placement as compacted fill.

Cut Slopes

Unless otherwise recommended by the Geotechnical Consultant and approved by the regulating agencies, permanent cut slopes should not be steeper than 2:1 (horizontal:vertical).

If excavations for cut slopes expose loose, cohesionless, significantly fractured or otherwise unsuitable material, over-excavation and replacement of the unsuitable materials with a compacted stabilization fill should be accomplished as recommended by the Geotechnical Consultant. Unless otherwise specified by the Geotechnical Consultant, stabilization fill construction should conform to the requirements of the Standard Details.

The Geotechnical Consultant should review cut slopes during excavation. The Geotechnical Consultant should be notified by the contractor prior to beginning slope excavations.

If, during the course of grading, adverse or potentially adverse geotechnical conditions are encountered which were not anticipated in the preliminary report, the Geotechnical Consultant should explore, analyze and make recommendations to treat these problems.

When cut slopes are made in the direction of the prevailing drainage, a non-erodible diversion swale (brow ditch) should be provided at the top-of-cut.

Pad Areas

All lot pad areas, including side yard terraces, above stabilization fills or buttresses should be over-excavated to provide for a minimum of 3-feet (refer to Standard Details) of compacted fill over the entire pad area. Pad areas with both fill and cut materials exposed and pad areas containing both very shallow (less than 3-feet) and deeper fill should be over-excavated to provide for a uniform compacted fill blanket with a minimum of 3-feet in thickness (refer to Standard Details).

Cut areas exposing significantly varying material types should also be over-excavated to provide for at least a 3-foot thick compacted fill blanket. Geotechnical conditions may require greater depth of over-excavation. The actual depth should be delineated by the Geotechnical Consultant during grading.

For pad areas created above cut or natural slopes, positive drainage should be established away from the top-of-slope. This may be accomplished utilizing a berm and/or an appropriate pad gradient. A gradient in soil areas away from the top-of-slopes of 2 percent or greater is recommended.

COMPACTED FILL

All fill materials should be compacted as specified below or by other methods specifically recommended by the Geotechnical Consultant. Unless otherwise specified, the minimum degree of compaction (relative compaction) should be 90 percent of the laboratory maximum density.

Placement

Prior to placement of compacted fill, the Contractor should request a review by the Geotechnical Consultant of the exposed ground surface. Unless otherwise recommended, the exposed ground surface should then be scarified (6-inches minimum), watered or dried as needed, thoroughly blended to achieve near optimum moisture conditions, then thoroughly compacted to a minimum of 90 percent of the maximum density. The review by the Geotechnical Consultant should not be considered to preclude requirements of inspection and approval by the governing agency.

Compacted fill should be placed in thin horizontal lifts not exceeding 8-inches in loose thickness prior to compaction. Each lift should be watered or dried as needed, thoroughly blended to achieve near optimum moisture conditions then thoroughly compacted by mechanical methods to a minimum of 90 percent of laboratory maximum dry density. Each lift should be treated in a like manner until the desired finished grades are achieved.

The Contractor should have suitable and sufficient mechanical compaction equipment and watering apparatus on the job site to handle the amount of fill being placed in consideration of moisture retention properties of the materials. If necessary, excavation equipment should be "shut down" temporarily in order to permit proper compaction of fills. Earth moving equipment should only be considered a supplement and not substituted for conventional compaction equipment.

When placing fill in horizontal lifts adjacent to areas sloping steeper than 5:1 (horizontal:vertical), horizontal keys and vertical benches should be excavated into the adjacent slope area. Keying and benching should be sufficient to provide at least 6-foot wide benches and minimum of 4-feet of vertical bench height within the firm natural ground, firm bedrock or engineered compacted fill. No compacted fill should be placed in an area subsequent to keying and benching until the area has been reviewed by the Geotechnical Consultant.

Material generated by the benching operation should be moved sufficiently away from the bench area to allow for the recommended review of the horizontal bench prior to placement of fill. Typical keying and benching details have been included within the accompanying Standard Details.

Within a single fill area where grading procedures dictate two or more separate fills, temporary slopes (false slopes) may be created. When placing fill adjacent to a false slope, benching should be conducted in the same manner as above described. At least a 3-foot vertical bench should be established within the firm core of adjacent approved compacted fill prior to placement of additional fill. Benching should proceed in at least 3-foot vertical increments until the desired finished grades are achieved.

Fill should be tested for compliance with the recommended relative compaction and moisture conditions. Field density testing should conform to ASTM Method of Test D 1556-07, and/or D 6938-10. Tests should be provided for about every 2 vertical feet or 1,000 cubic yards of fill placed. Actual test intervals may vary as field conditions dictate. Fill found not to be in conformance with the grading recommendations should be removed or otherwise handled as recommended by the Geotechnical Consultant.

The Contractor should assist the Geotechnical Consultant and/or his representative by digging test pits for removal determinations and/or for testing compacted fill.

As recommended by the Geotechnical Consultant, the Contractor should "shut down" or remove grading equipment from an area being tested.

The Geotechnical Consultant should maintain a plan with estimated locations of field tests. Unless the client provides for actual surveying of test locations, the estimated locations by the Geotechnical Consultant should only be considered rough estimates and should not be utilized for the purpose of preparing cross sections showing test locations or in any case for the purpose of after-the-fact evaluating of the sequence of fill placement.

Moisture

For field testing purposes, "near optimum" moisture will vary with material type and other factors including compaction procedures. "Near optimum" may be specifically recommended in Preliminary Investigation Reports and/or may be evaluated during grading.

Prior to placement of additional compacted fill following an overnight or other grading delay, the exposed surface or previously compacted fill should be processed by scarification, watered or dried as needed, thoroughly blended to near-optimum moisture conditions, then recompacted to a minimum of 90 percent of laboratory maximum dry density. Where wet or other dry or other unsuitable materials exist to depths of greater than 1 foot, the unsuitable materials should be over-excavated.

Following a period of flooding, rainfall or overwatering by other means, no additional fill should be placed until damage assessments have been made and remedial grading performed as described herein.

Fill Material

Excavated on-site materials which are acceptable to the Geotechnical Consultant may be utilized as compacted fill, provided trash, vegetation and other deleterious materials are removed prior to placement.

Where import materials are required for use on-site, the Geotechnical Consultant should be notified at least 72 hours in advance of importing, in order to sample and test materials from proposed borrow sites. No import materials should be delivered for use on-site without prior sampling and testing by Geotechnical Consultant.

Where oversized rock or similar irreducible material is generated during grading, it is recommended, where practical, to waste such material off-site or on-site in areas designated as "nonstructural rock disposal areas". Rock placed in disposal areas should be placed with sufficient fines to fill voids. The rock should be compacted in lifts to an unyielding condition. The disposal area should be covered with at least 3 feet of compacted fill which is free of oversized material. The upper 3 feet should be placed in accordance with the guidelines for compacted fill herein.

Rocks 8 inches in maximum dimension and smaller may be utilized within the compacted fill, provided they are placed in such a manner that nesting of the rock is avoided. Fill should be placed and thoroughly compacted over and around all rock. The amount of rock should not exceed 40 percent by dry weight passing the $^{3}/_{4}$-inch sieve size. The 12-inch and 40 percent recommendations herein may vary as field conditions dictate.

During the course of grading operations, rocks or similar irreducible materials greater than 8-inches maximum dimension (oversized material) may be generated. These rocks should not be placed within the compacted fill unless placed as recommended by the Geotechnical Consultant.

Where rocks or similar irreducible materials of greater than 8 inches but less than 4 feet of maximum dimension are generated during grading, or otherwise desired to be placed within an engineered fill, special handling in accordance with the accompanying Standard Details is recommended. Rocks greater than 4 feet should be broken down or disposed off-site. Rocks up to 4 feet maximum dimension should be placed below the upper 10 feet of any fill and should not be closer than 20-feet to any slope face. These recommendations could vary as locations of improvements dictate. Where practical, oversized material should not be placed below areas where structures or deep utilities are proposed.

Oversized material should be placed in windrows on a clean, over-excavated or unyielding compacted fill or firm natural ground surface. Select native or imported granular soil (S.E. 30 or higher) should be placed and thoroughly flooded over and around all windrowed rock, such that voids are filled. Windrows of oversized material should be staggered so that successive strata of oversized material are not in the same vertical plane.

It may be possible to dispose of individual larger rock as field conditions dictate and as recommended by the Geotechnical Consultant at the time of placement. Material that is considered unsuitable by the Geotechnical Consultant should not be utilized in the compacted fill.

During grading operations, placing and mixing the materials from the cut and/or borrow areas may result in soil mixtures which possess unique physical properties. Testing may be required of samples obtained directly from the fill areas in order to verify conformance with the specifications. Processing of these additional samples may take two or more working days. The Contractor may elect to move the operation to other areas within the project, or may continue placing compacted fill pending laboratory and field test results. Should he elect the second alternative, fill placed is done so at the Contractor's risk.

Any fill placed in areas not previously reviewed and evaluated by the Geotechnical Consultant, and/or in other areas, without prior notification to the Geotechnical Consultant may require removal and recompaction at the Contractor's expense. Determination of over-excavations should be made upon review of field conditions by the Geotechnical Consultant.

Fill Slopes

Unless otherwise recommended by the Geotechnical Consultant and approved by the regulating agencies, permanent fill slopes should not be steeper than 2:1 (horizontal to vertical).

Except as specifically recommended otherwise or as otherwise provided for in these grading guidelines (Reference Fill Materials), compacted fill slopes should be overbuilt and cut back to grade, exposing the firm, compacted fill inner core. The actual amount of overbuilding may vary as field conditions dictate. If the desired results are not achieved, the existing slopes should be over-excavated and reconstructed under the guidelines of the Geotechnical Consultant. The degree of overbuilding shall be increased until the desired compacted slope surface condition is achieved. Care should be taken by the Contractor to provide thorough mechanical compaction to the outer edge of the overbuilt slope surface.

Although no construction procedure produces a slope free from risk of future movement, overfilling and cutting back of slope to a compacted inner core is, given no other constraints, the most desirable procedure. Other constraints, however, must often be considered. These constraints may include property line situations, access, the critical nature of the development and cost. Where such constraints are identified, slope face compaction may be attempted by conventional construction procedures including back rolling techniques upon specific recommendation by the Geotechnical Consultant.

As a second best alternative for slopes of 2:1 (horizontal to vertical) or flatter, slope construction may be attempted as outlined herein. Fill placement should proceed in thin lifts, (i.e., 6 to 8 inch loose thickness). Each lift should be moisture conditioned and thoroughly compacted. The desired moisture condition should be maintained and/or reestablished, where necessary, during the period between successive lifts. Selected lifts should be tested to ascertain that desired compaction is being achieved. Care should be taken to extend compactive effort to the outer edge of the slope. Each lift should extend horizontally to the desired finished slope surface or more as needed to ultimately establish desired grades. Grade during construction should not be allowed to roll off at the edge of the slope. It may be helpful to elevate slightly the outer edge of the slope.

Slough resulting from the placement of individual lifts should not be allowed to drift down over previous lifts. At intervals not exceeding 4 feet in vertical slope height or the capability of available equipment, whichever is less, fill slopes should be thoroughly backrolled utilizing a conventional sheeps foot-type roller. Care should be taken to maintain the desired moisture conditions and/or reestablishing same as needed prior to backrolling. Upon achieving final grade, the slopes should again be moisture conditioned and thoroughly backrolled. The use of a side-boom roller will probably be necessary and vibratory methods are strongly recommended. Without delay, so as to avoid (if possible) further moisture conditioning, the slopes should then be grid-rolled to achieve a relatively smooth surface and uniformly compact condition.

In order to monitor slope construction procedures, moisture and density tests will be taken at regular intervals. Failure to achieve the desired results will likely result in a recommendation by the Geotechnical Consultant to over-excavate the slope surfaces followed by reconstruction of the slopes utilizing overfilling and cutting back procedures and/or further attempt at the conventional backrolling approach. Other recommendations may also be provided which would be commensurate with field conditions.

Where placement of fill above a natural slope or above a cut slope is proposed, the fill slope configuration as presented in the accompanying Standard Details should be adopted.

For pad areas above fill slopes, positive drainage should be established away from the top-of-slope. This may be accomplished utilizing a berm and pad gradients of at least 2 percent in soil areas.

Off-Site Fill

Off-site fill should be treated in the same manner as recommended in these specifications for site preparation, excavation, drains, compaction, etc.

Off-site canyon fill should be placed in preparation for future additional fill, as shown in the accompanying Standard Details.

Off-site fill subdrains temporarily terminated (up canyon) should be surveyed for future relocation and connection.

DRAINAGE

Canyon subdrain systems specified by the Geotechnical Consultant should be installed in accordance with the Standard Details.

Typical subdrains for compacted fill buttresses, slope stabilization or sidehill masses, should be installed in accordance with the specifications of the accompanying Standard Details.

Roof, pad and slope drainage should be directed away from slopes and areas of structures to suitable disposal areas via non-erodible devices (i.e., gutters, downspouts, concrete swales).

For drainage over soil areas immediately away from structures (i.e., within 4 feet), a minimum of 4 percent gradient should be maintained. Pad drainage of at least 2 percent should be maintained over soil areas. Pad drainage may be reduced to at least 1 percent for projects where no slopes exist, either natural or man-made, or greater than 10-feet in height and where no slopes are planned, either natural or man-made, steeper than 2:1 (horizontal to vertical slope ratio).

Drainage patterns established at the time of fine grading should be maintained throughout the life of the project. Property owners should be made aware that altering drainage patterns can be detrimental to slope stability and foundation performance.

STAKING

In all fill areas, the fill should be compacted prior to the placement of the stakes. This particularly is important on fill slopes. Slope stakes should not be placed until the slope is thoroughly compacted (backrolled). If stakes must be placed prior to the completion of compaction procedures, it must be recognized that they will be removed and/or demolished at such time as compaction procedures resume.

In order to allow for remedial grading operations, which could include over-excavations or slope stabilization, appropriate staking offsets should be provided. For finished slope and stabilization backcut areas, we recommend at least a 10-feet setback from proposed toes and tops-of-cut.

SLOPE MAINTENANCE

Landscape Plants

In order to enhance surficial slope stability, slope planting should be accomplished at the completion of grading. Slope planting should consist of deep-rooting vegetation requiring little watering. Plants native to the southern California area and plants relative to native plants are generally desirable. Plants native to other semi-arid and arid areas may also be appropriate. A Landscape Architect would be the best party to consult regarding actual types of plants and planting configuration.

Irrigation

Irrigation pipes should be anchored to slope faces, not placed in trenches excavated into slope faces.

Slope irrigation should be minimized. If automatic timing devices are utilized on irrigation systems, provisions should be made for interrupting normal irrigation during periods of rainfall.

Though not a requirement, consideration should be given to the installation of near-surface moisture monitoring control devices. Such devices can aid in the maintenance of relatively uniform and reasonably constant moisture conditions.

Property owners should be made aware that overwatering of slopes is detrimental to slope stability.

Maintenance

Periodic inspections of landscaped slope areas should be planned and appropriate measures should be taken to control weeds and enhance growth of the landscape plants. Some areas may require occasional replanting and/or reseeding.

Terrace drains and down drains should be periodically inspected and maintained free of debris. Damage to drainage improvements should be repaired immediately.

Property owners should be made aware that burrowing animals can be detrimental to slope stability. A preventative program should be established to control burrowing animals.

As a precautionary measure, plastic sheeting should be readily available, or kept on hand, to protect all slope areas from saturation by periods of heavy or prolonged rainfall. This measure is strongly recommended, beginning with the period of time prior to landscape planting.

Repairs

If slope failures occur, the Geotechnical Consultant should be contacted for a field review of site conditions and development of recommendations for evaluation and repair.

If slope failures occur as a result of exposure to periods of heavy rainfall, the failure area and currently unaffected areas should be covered with plastic sheeting to protect against additional saturation.

In the accompanying Standard Details, appropriate repair procedures are illustrated for superficial slope failures (i.e., occurring typically within the outer 1 foot to 3 feet of a slope face).

TRENCH BACKFILL

Utility trench backfill should, unless otherwise recommended, be compacted by mechanical means. Unless otherwise recommended, the degree of compaction should be a minimum of 90 percent of the laboratory maximum density.

Backfill of exterior and interior trenches extending below a 1:1 projection from the outer edge of foundations should be mechanically compacted to a minimum of 90 percent of the laboratory maximum density.

In cases where clean granular materials are proposed for use in lieu of native materials or where flooding or jetting is proposed, the procedures should be considered subject to review by the Geotechnical Consultant.

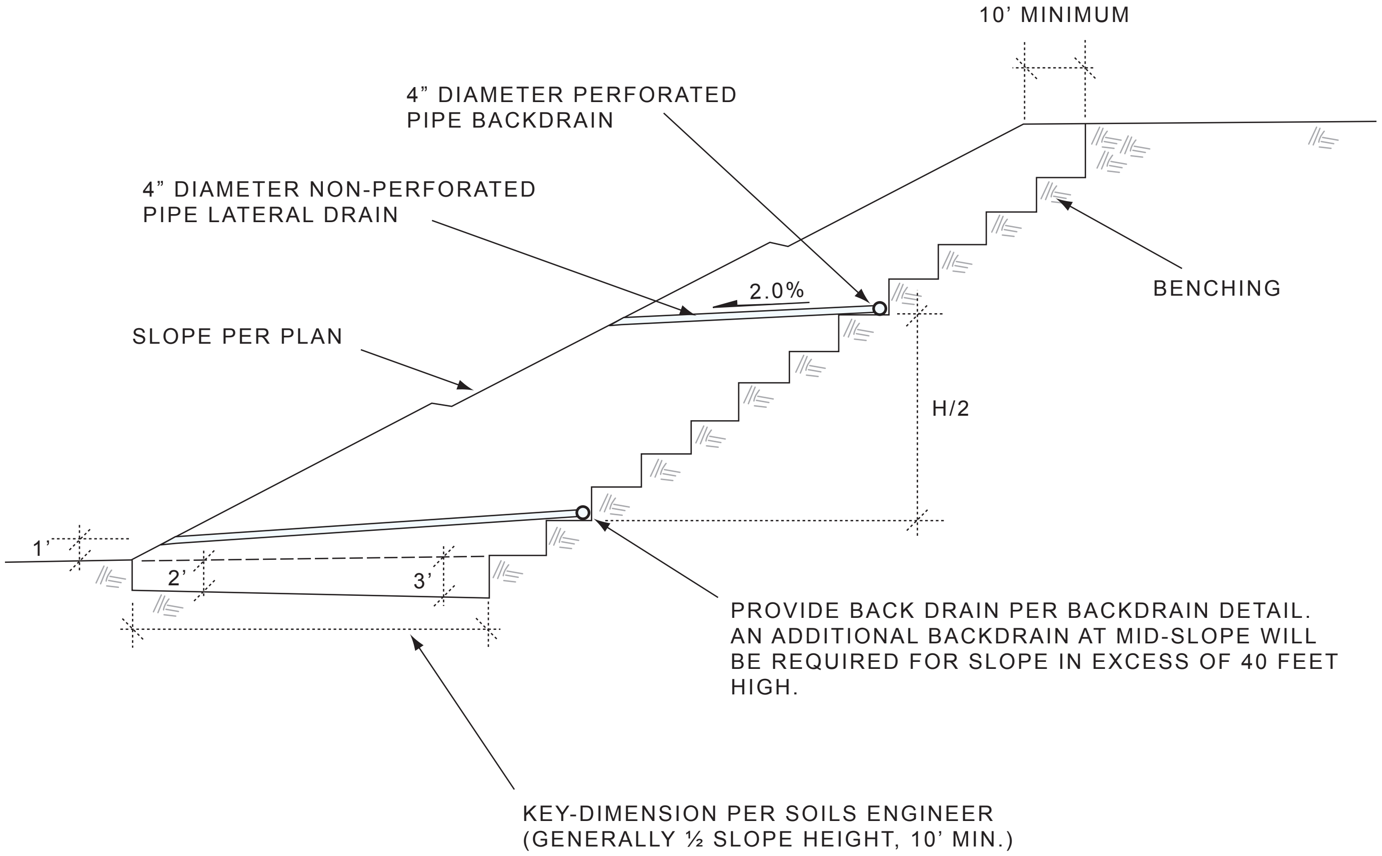
Clean Granular backfill and/or bedding are not recommended in slope areas unless provisions are made for a drainage system to mitigate the potential build-up of seepage forces.

STATUS OF GRADING

Prior of proceeding with any grading operation, the Geotechnical Consultant should be notified at least two working days in advance in order to schedule the necessary observation and testing services.

Prior to any significant expansion or cut back in the grading operation, the Geotechnical Consultant should be provided with adequate notice (i.e., two days) in order to make appropriate adjustments in observation and testing services.

Following completion of grading operations and/or between phases of a grading operation, the Geotechnical Consultant should be provided with at least two working days notice in advance of commencement of additional grading operations.



TYPICAL STABILIZATION FILL DETAIL

NOT TO SCALE

FIGURE 1

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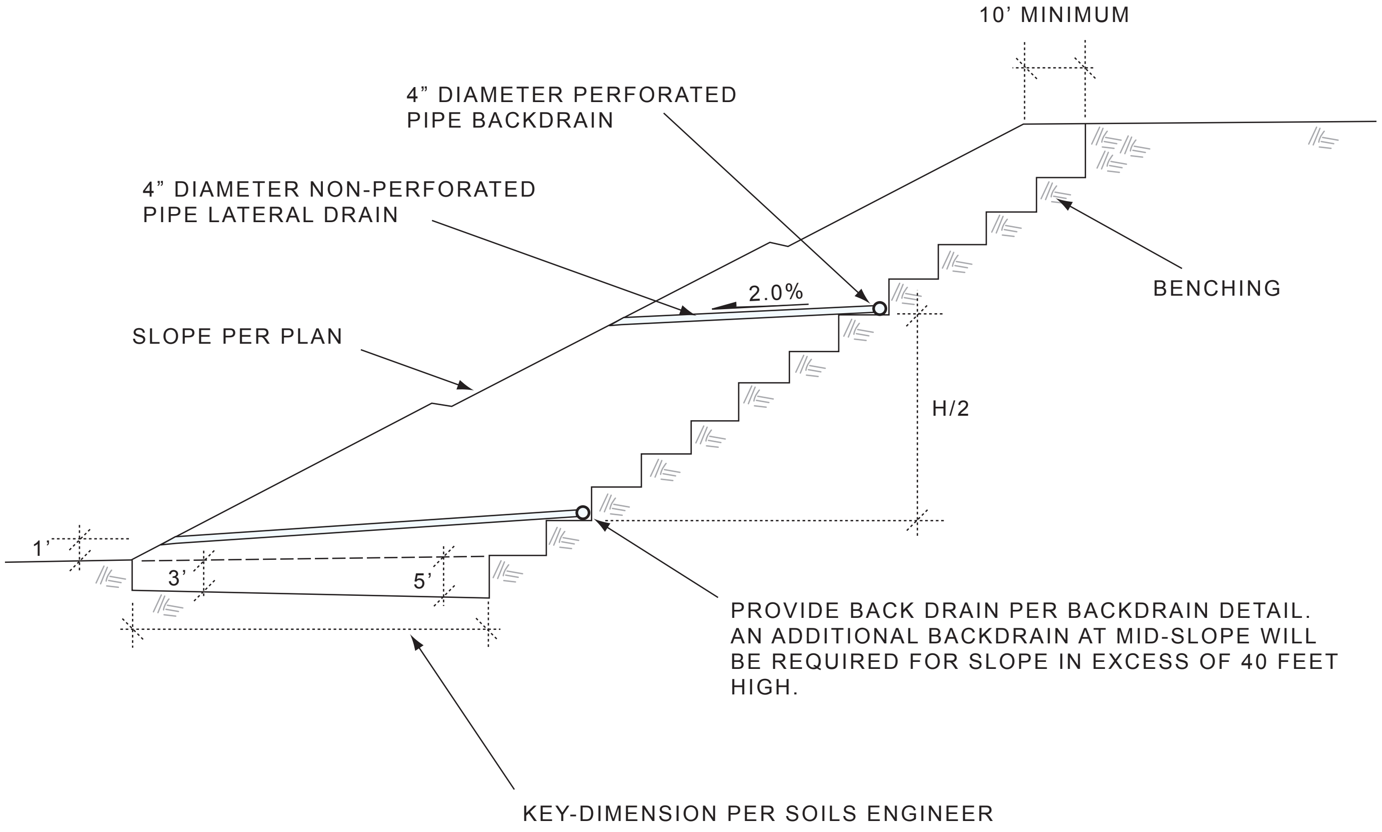
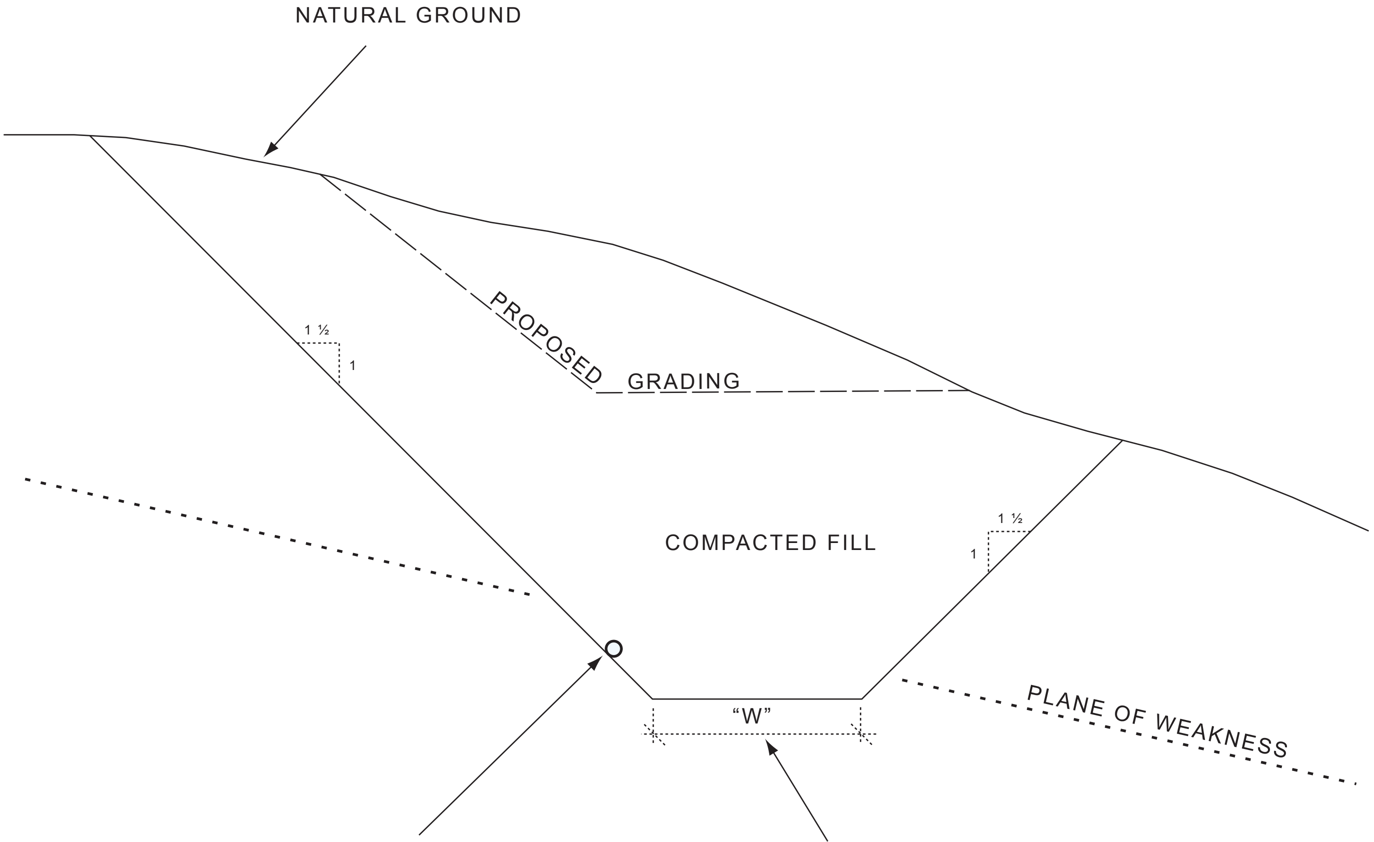


TYPICAL BUTTRESS FILL DETAIL

NOT TO SCALE

FIGURE 2



PROVIDE BACKDRAIN PER BACKDRAIN DETAIL. AN ADDITIONAL BACKDRAIN AT MID-SLOPE WILL BE REQURED FOR BACK SLOPES IN EXCESS OF 40 FEET HIGH. LOCATIONS OF BACKDRAINS AND OUTLETS PER SOILS ENGINEER AND/OR ENGINEERING GEOLOGIST DURING GRADING.

BASE WIDTH "W" DETERMINED BY SOILS ENGINEER

TYPICAL SHEAR KEY DETAIL

NOT TO SCALE

FIGURE 3

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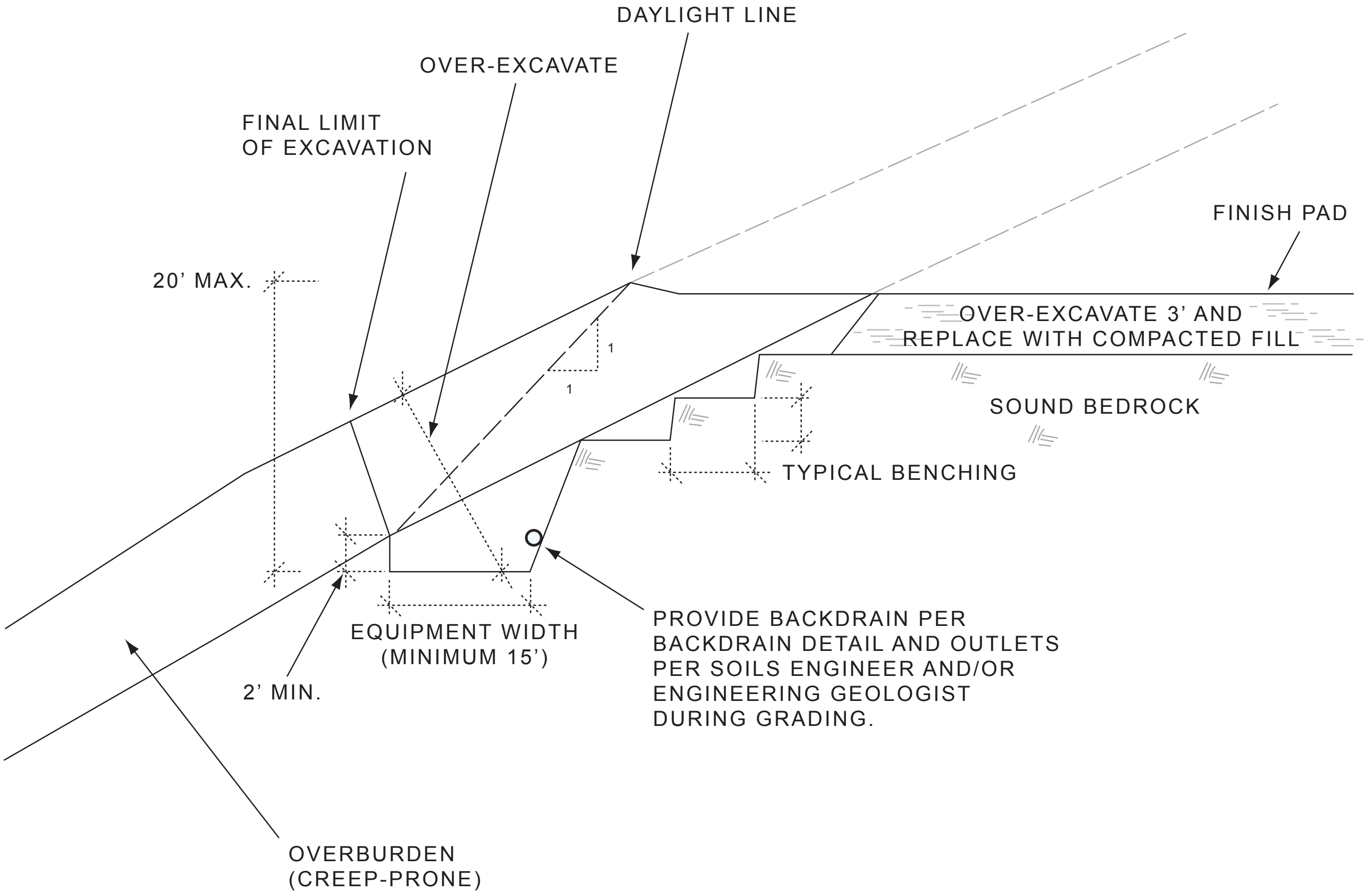

DAYLIGHT SHEAR KEY DETAIL

NOT TO SCALE

FIGURE 4

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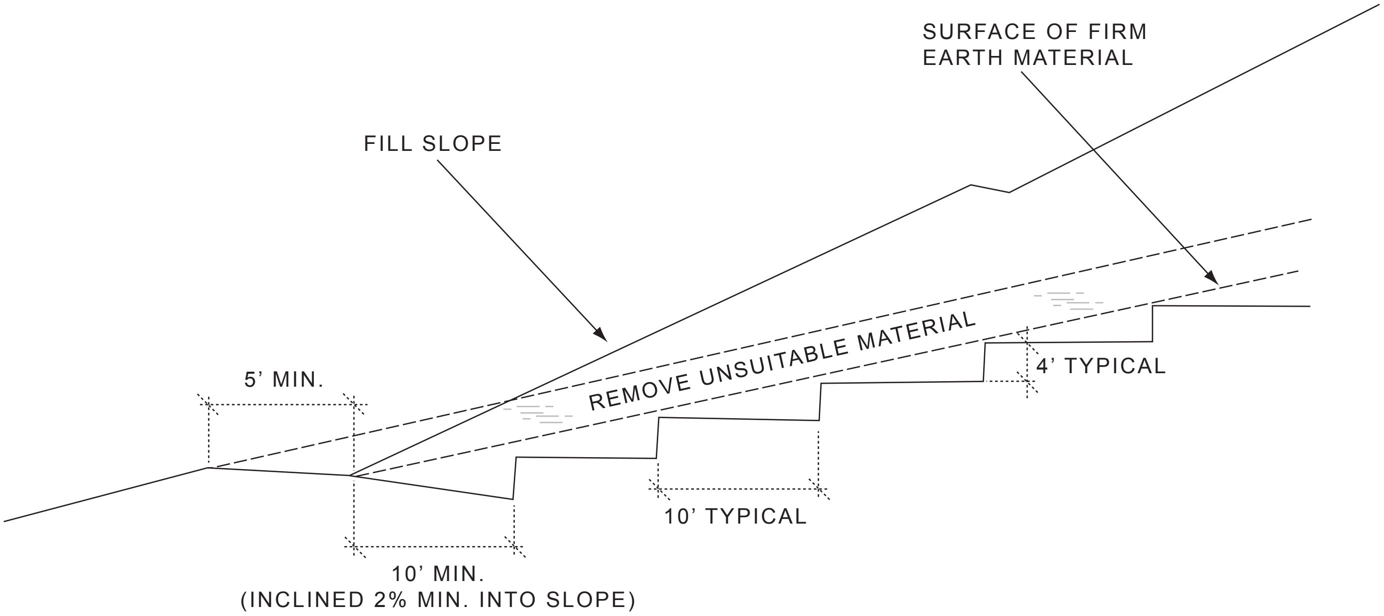
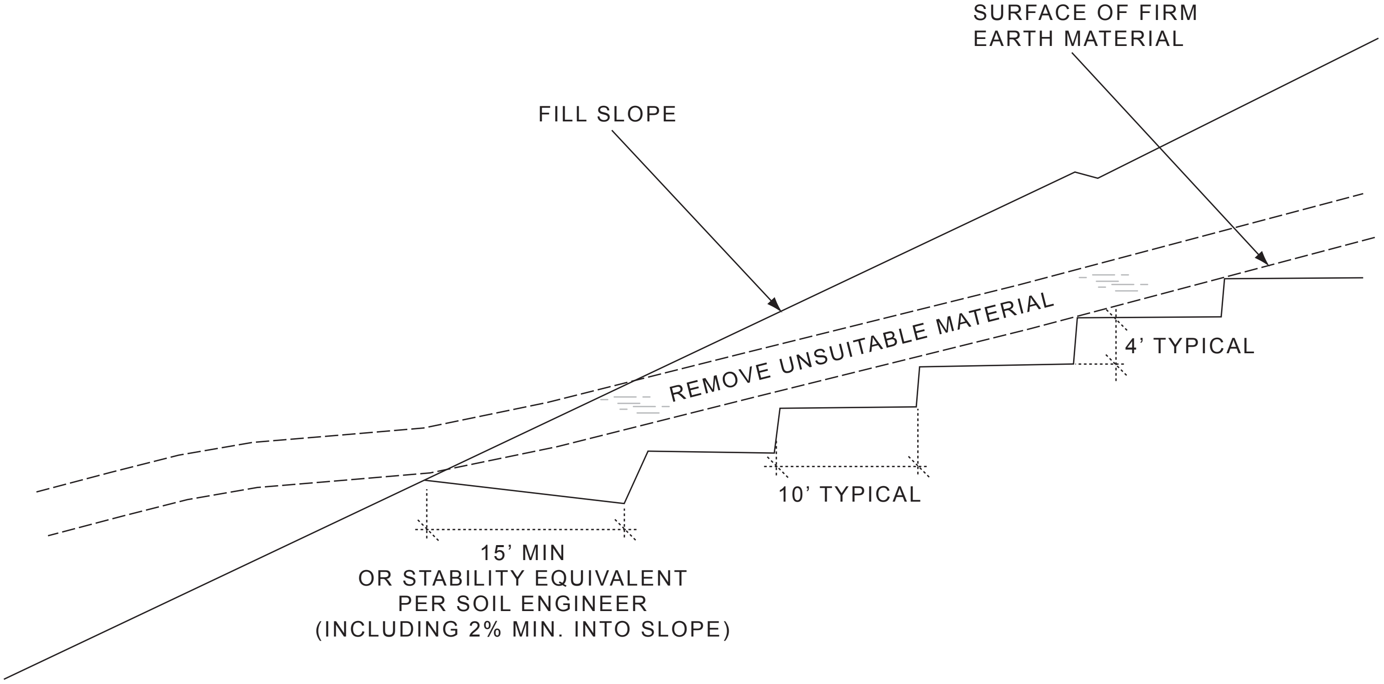
BENCHING FILL OVER NATURAL



BENCHING FILL OVER CUT



BENCHING FOR COMPACTED FILL DETAIL

NOT TO SCALE

FIGURE 5

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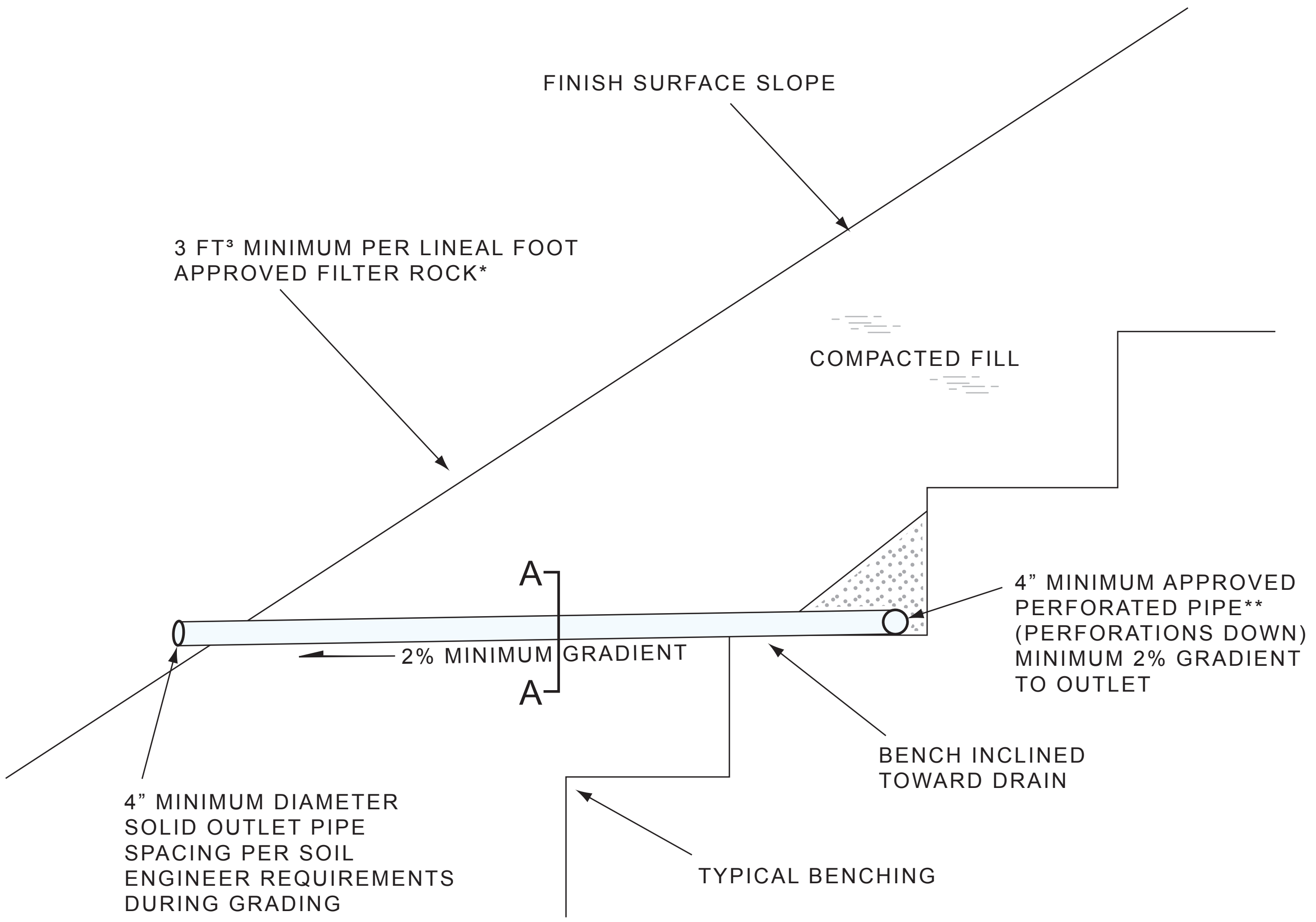
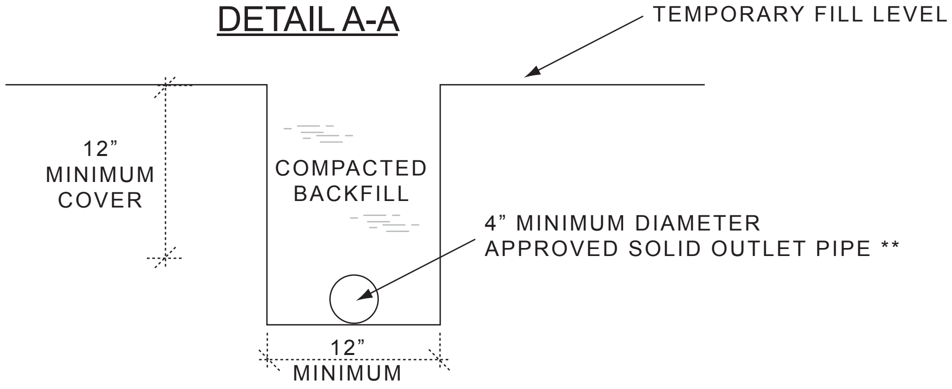


DETAIL A-A



* Filter rock to meet following specifications or approved equal.

Sieve	% Passing
1"	100
3/4"	90-100
3/8"	40-100
No.4	25-40
No.30	5-15
No.50	0-7
No.200	0-3

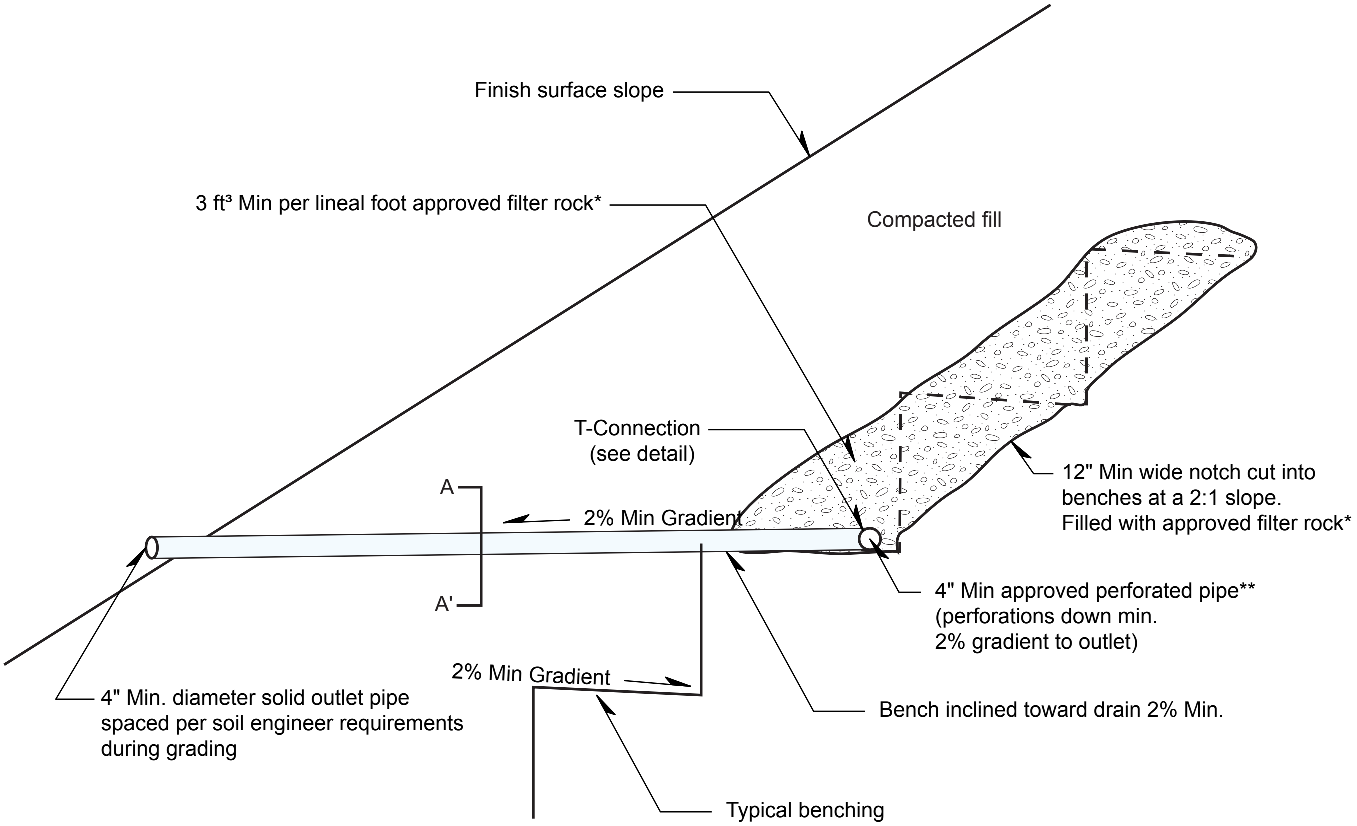
** APPROVED PIPE TYPE

Schedule 40 polyvinyl chloride (P.V.C.) or approved equal.
Min. crush strength 1000 PSI.

TYPICAL BACKDRAIN DETAIL

NOT TO SCALE

FIGURE 6



* Filter rock to meet following specifications or approved equal.

Sieve	% Passing
1"	100
3/4"	90-100
3/8"	40-100
No.4	25-40
No.30	5-15
No.50	0-7
No.200	0-3

** Approved pipe type:
Schedule 40 polyvinyl chloride
(P.V.C.) or approved equal.
Min. crush strength 1000 PSI.

BACKDRAIN DETAIL (GEOFABRIC)

FIGURE 7

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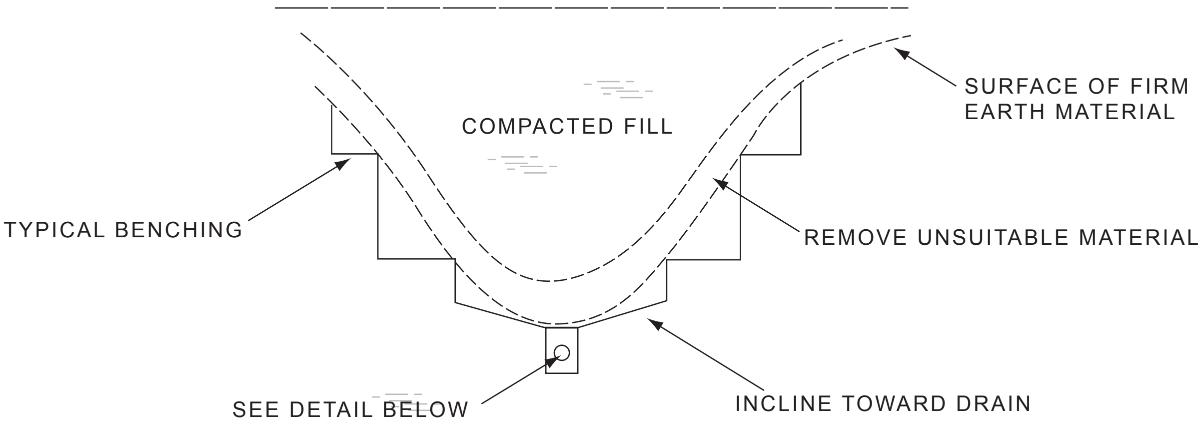
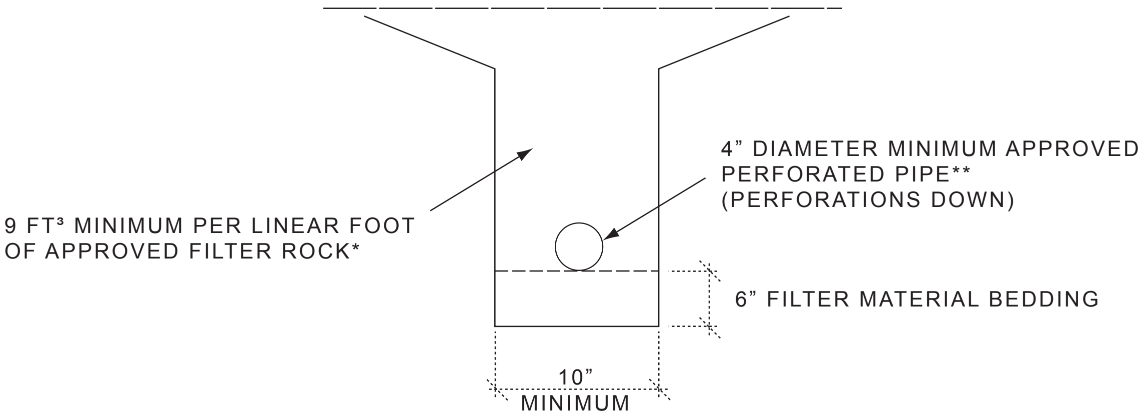


DETAIL



* Filter rock to meet following specifications or approved equal.

Sieve	% Passing
1"	100
3/4"	90-100
3/8"	40-100
No.4	25-40
No.30	5-15
No.50	0-7
No.200	0-3

** APPROVED PIPE TYPE

Schedule 40 polyvinyl chloride (P.V.C.) or approved equal.
Min. crush strength 1000 PSI.

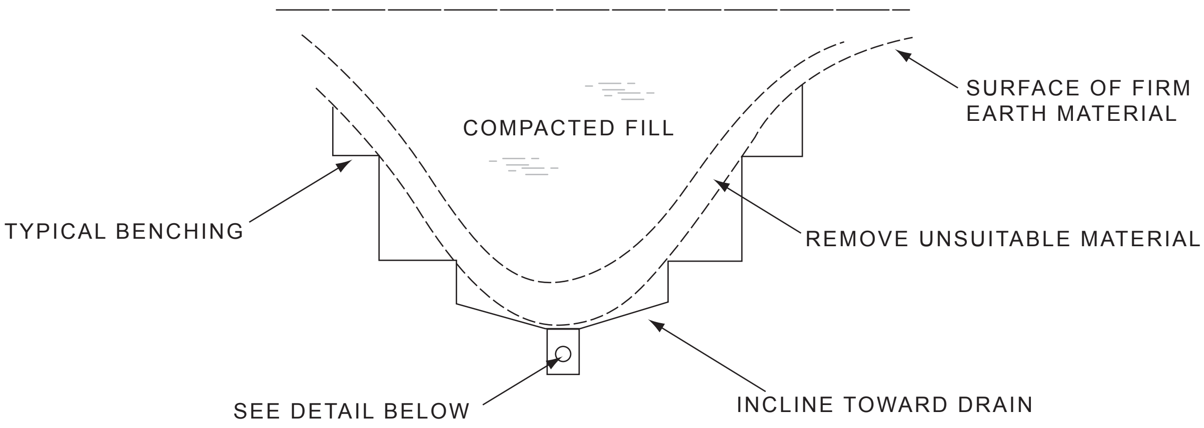
Pipe diameter to meet hte following criteria. Subject to field review based on actual geotechnical conditions encountered during grading.

Length of Run	Pipe Diameter
Upper 500’	4”
Next 1000’	6”
>1500’	8”

TYPICAL CANYON SUBDRAIN DETAIL

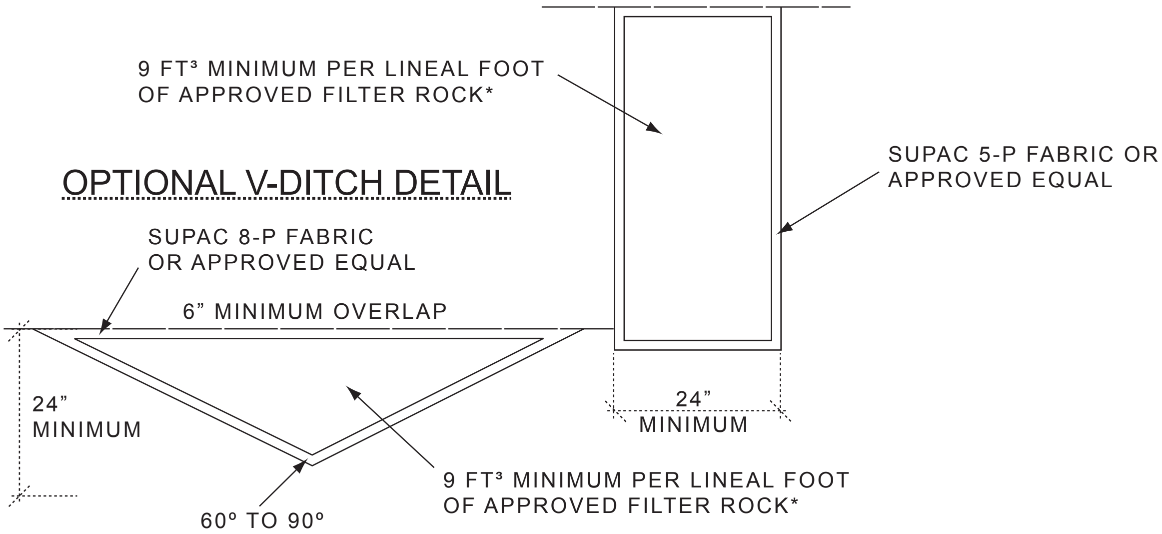
NOT TO SCALE

FIGURE 8



TRENCH DETAIL

OPTIONAL V-DITCH DETAIL



* Drainage material to meet following specifications or approved equal.

Sieve	% Passing
1 ½"	88-100
1"	5-40
3/4"	0-17
3/8"	0-7
No.200	0-3

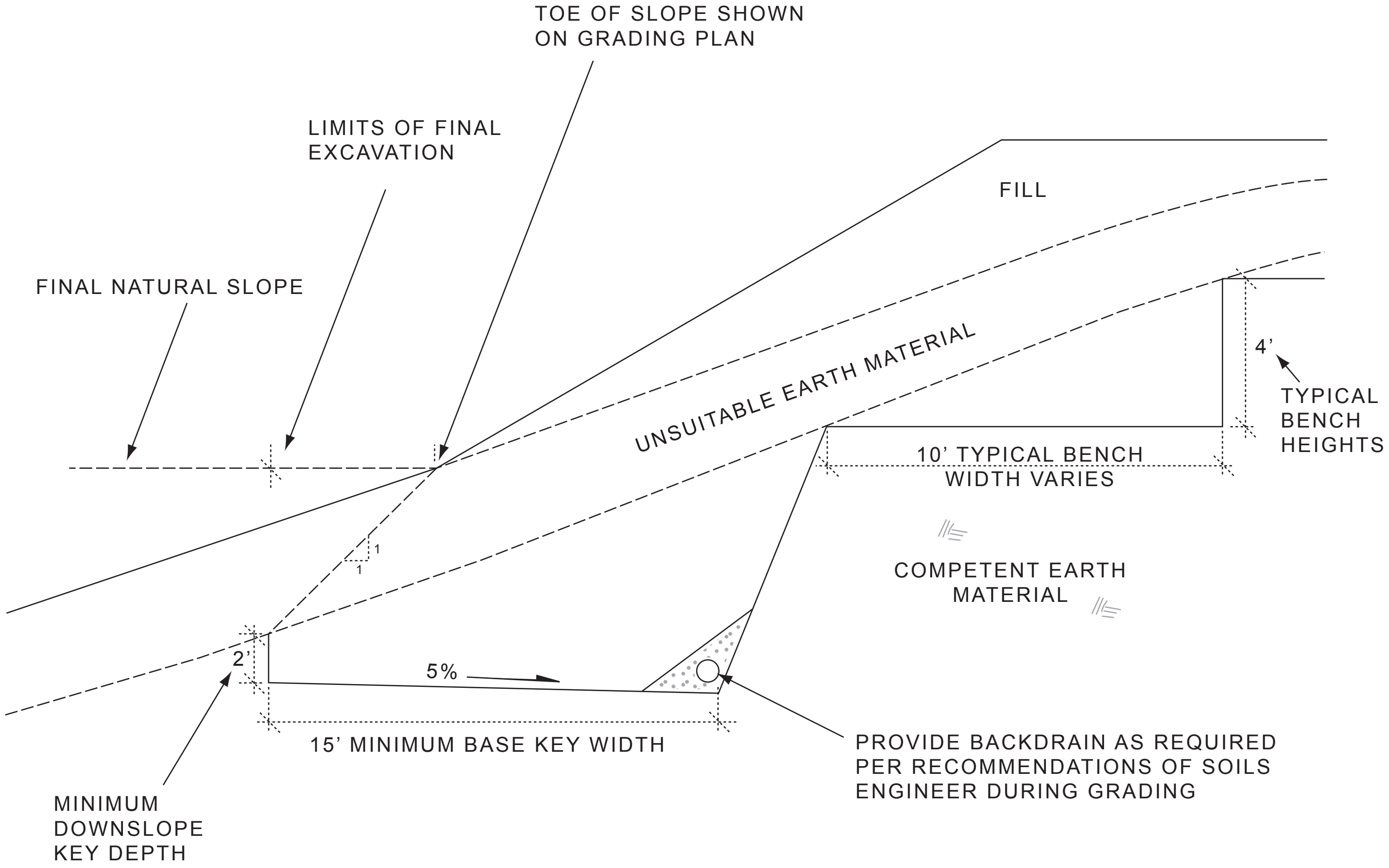
ADD MINIMUM 4" DIAMETER APPROVED PERFORATED PIPE WHEN GRADIENT IS LESS THAN 2%

APPROVED PIPE TO BE SCHEDULE 40 POLY-VINYL-CHLORIDE (P.V.C.) OR APPROVED EQUAL. MINIMUM CRUSH STRENGTH 1000 psi.

GEOFABRIC SUBDRAIN

NOT TO SCALE

FIGURE 9



WHERE NATURAL SLOPE GRADIENT IS 5:1 OR LESS, BENCHING IS NOT NECESSARY. HOWEVER, FILL IS NOT TO BE PLACED ON COMPRESSIBLE OR UNSUITABLE MATERIAL.

FILL SLOPE ABOVE NATURAL GROUND DETAIL

NOT TO SCALE

FIGURE 10

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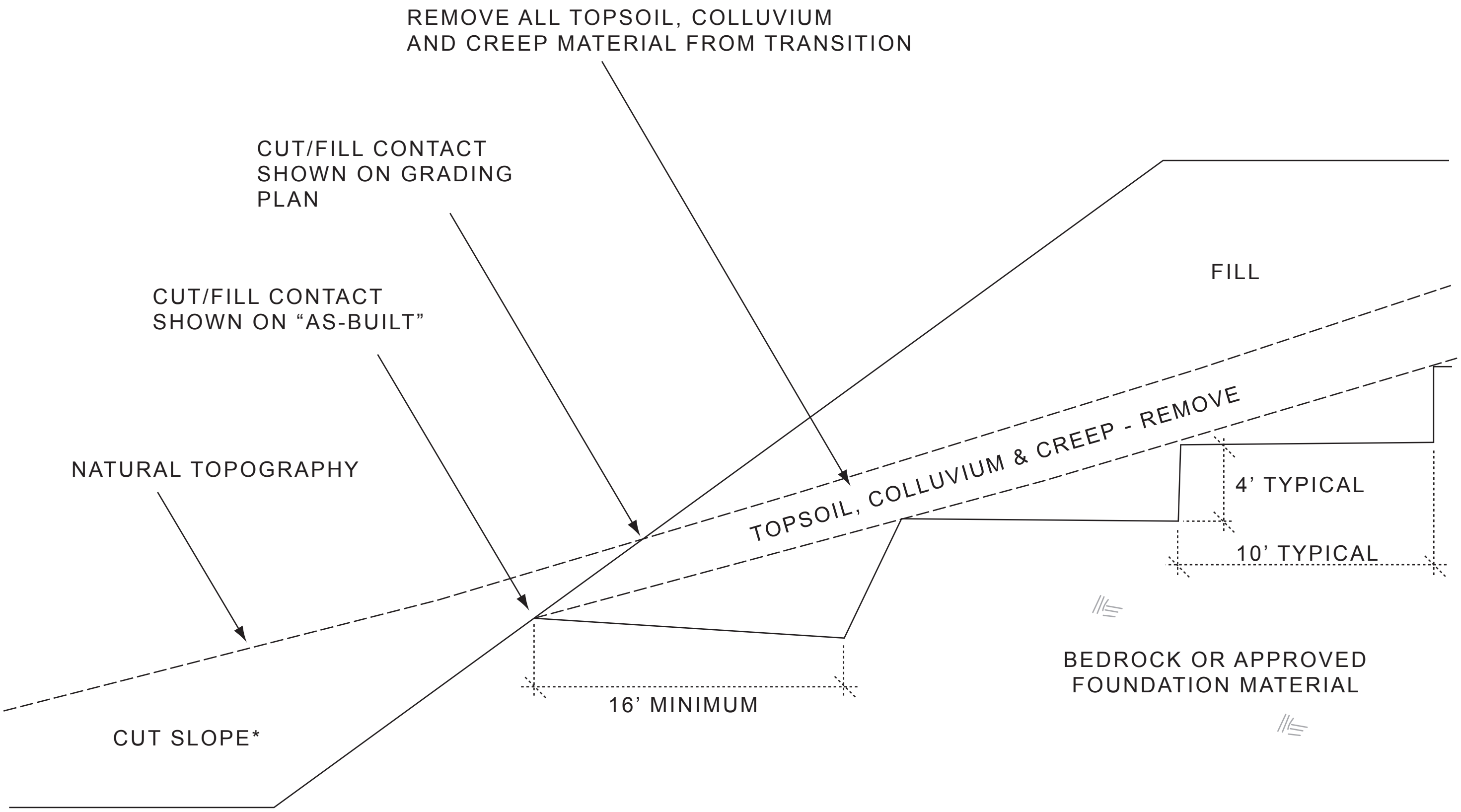

NOTE:
CUT SLOPE PORTION SHALL BE MADE
PRIOR TO PLACEMENT OF FILL

FILL SLOPE ABOVE CUT SLOPE DETAIL

NOT TO SCALE

FIGURE 11

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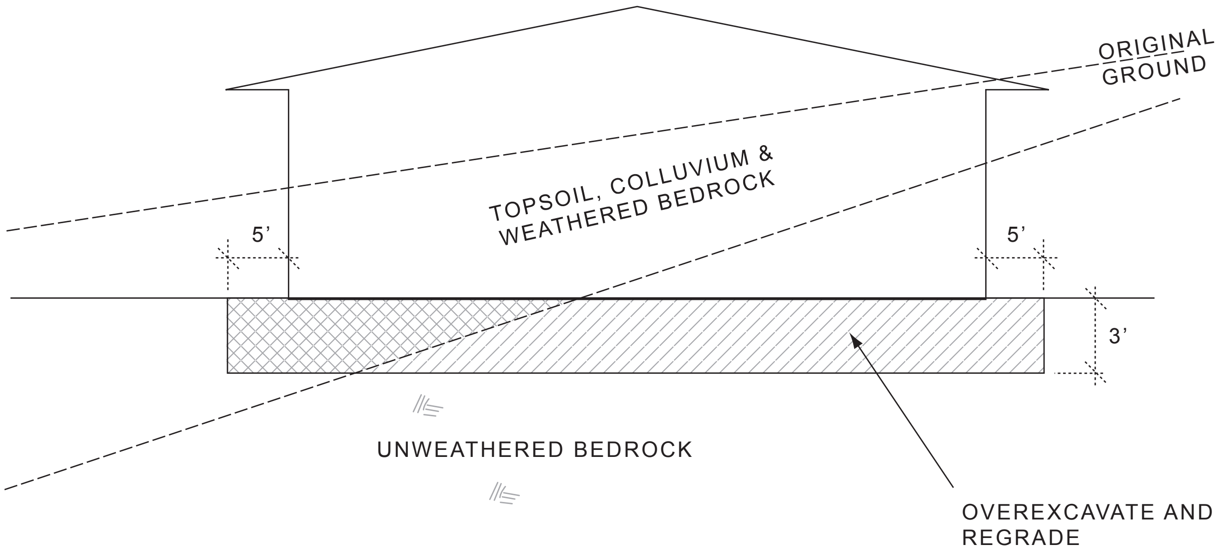
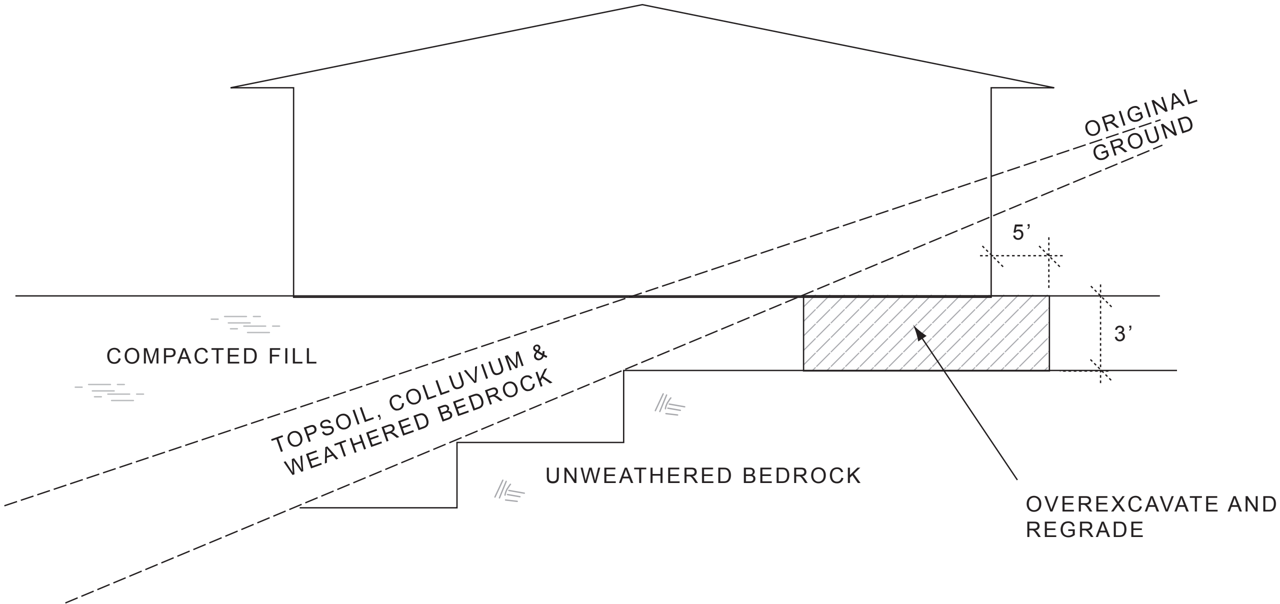
CUT LOT



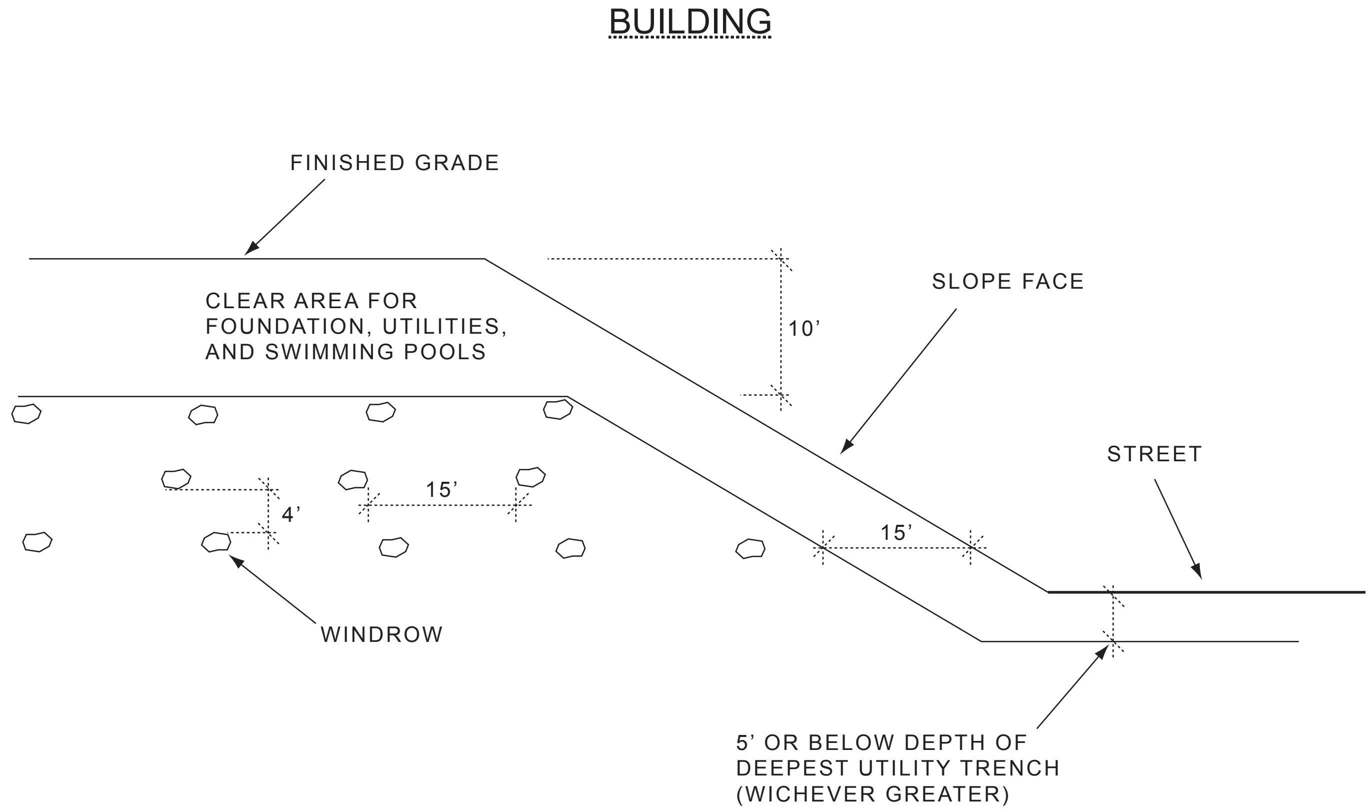
CUT/FILL LOT (TRANSITION)



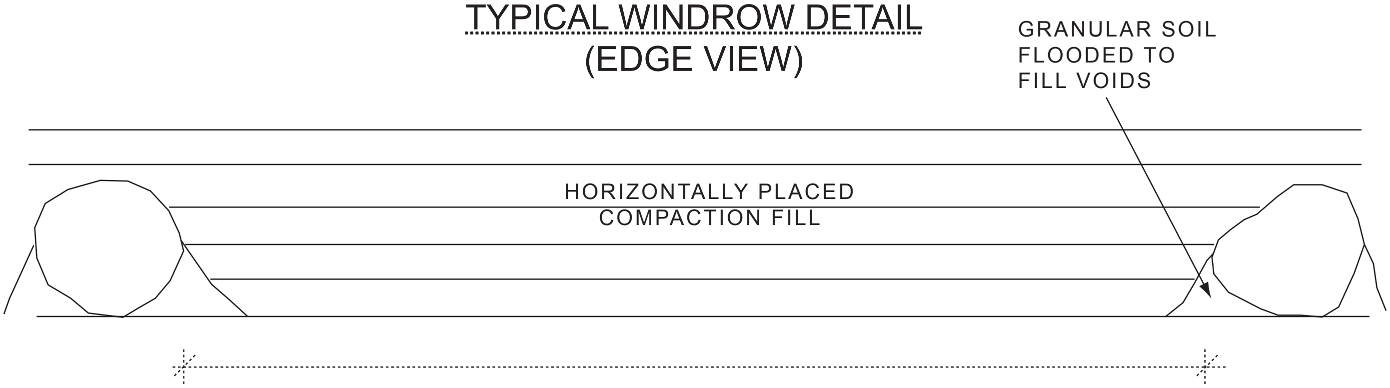
TRANSITION LOT DETAIL

NOT TO SCALE

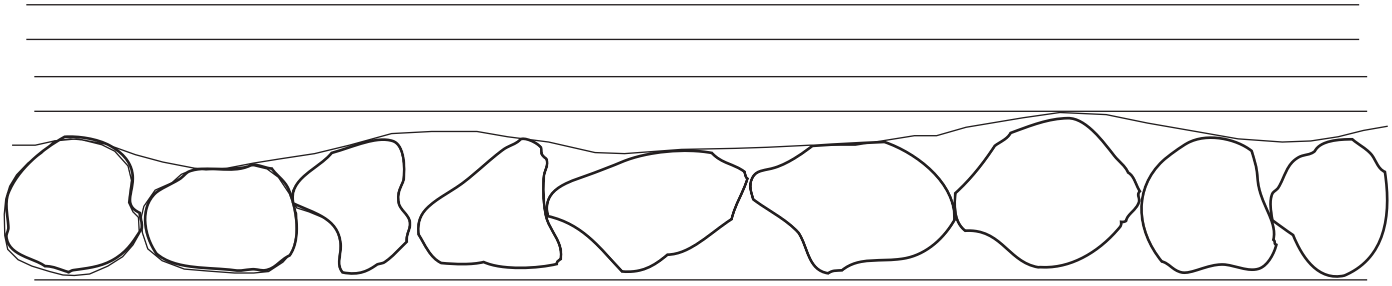
FIGURE 12



TYPICAL WINDROW DETAIL
(EDGE VIEW)



(PROFILE VIEW)



ROCK DISPOSAL DETAIL

NOT TO SCALE

FIGURE 13

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